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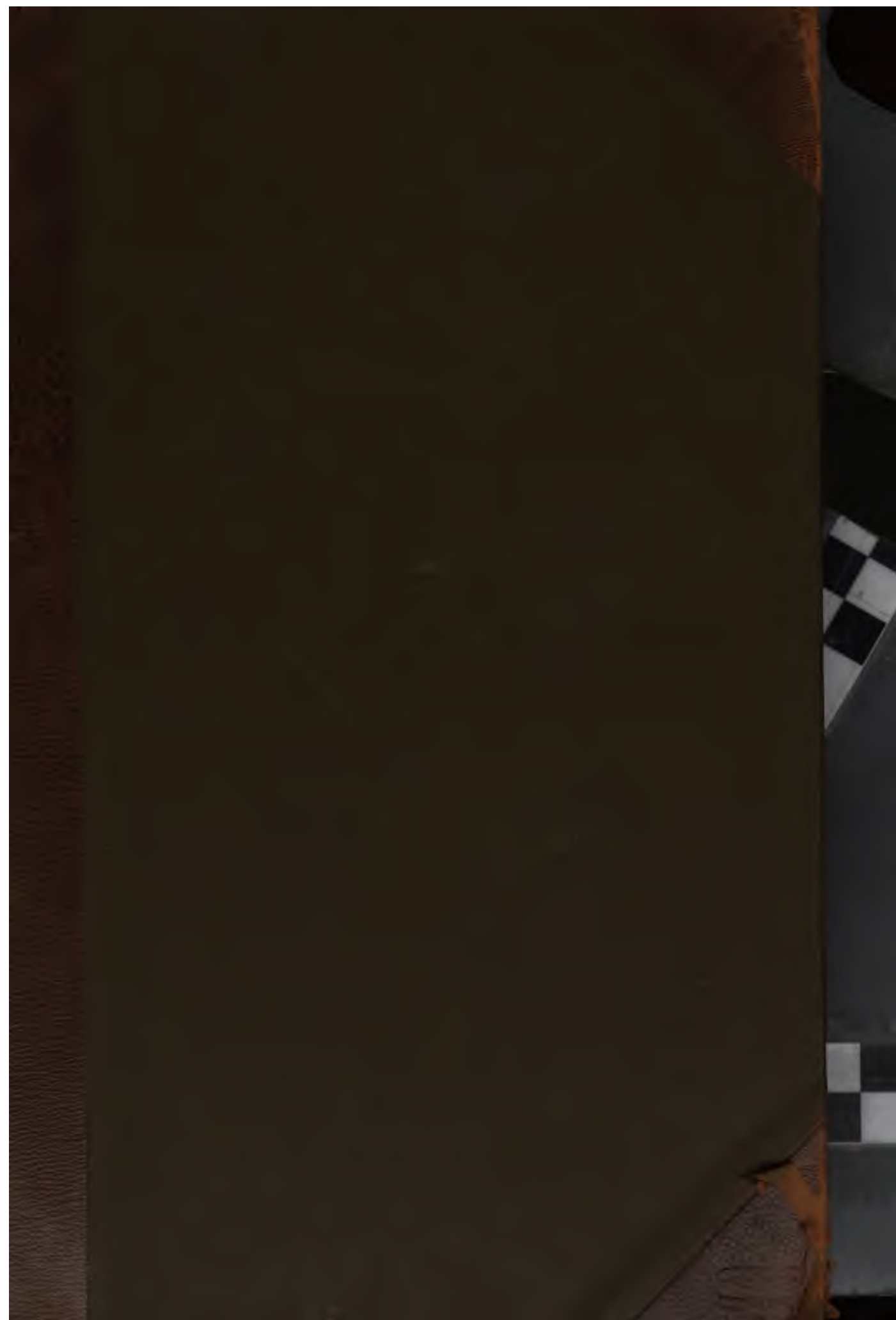
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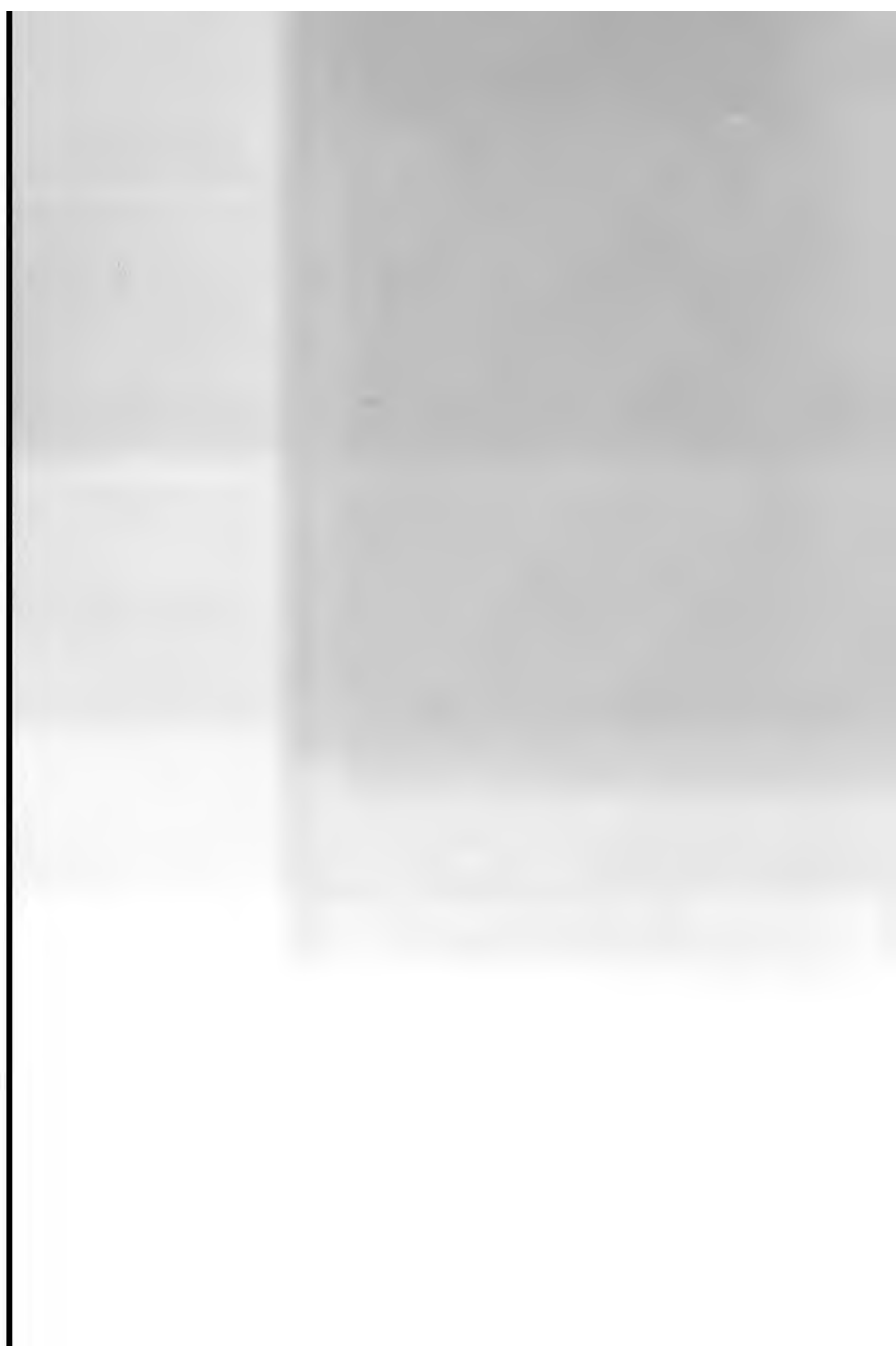










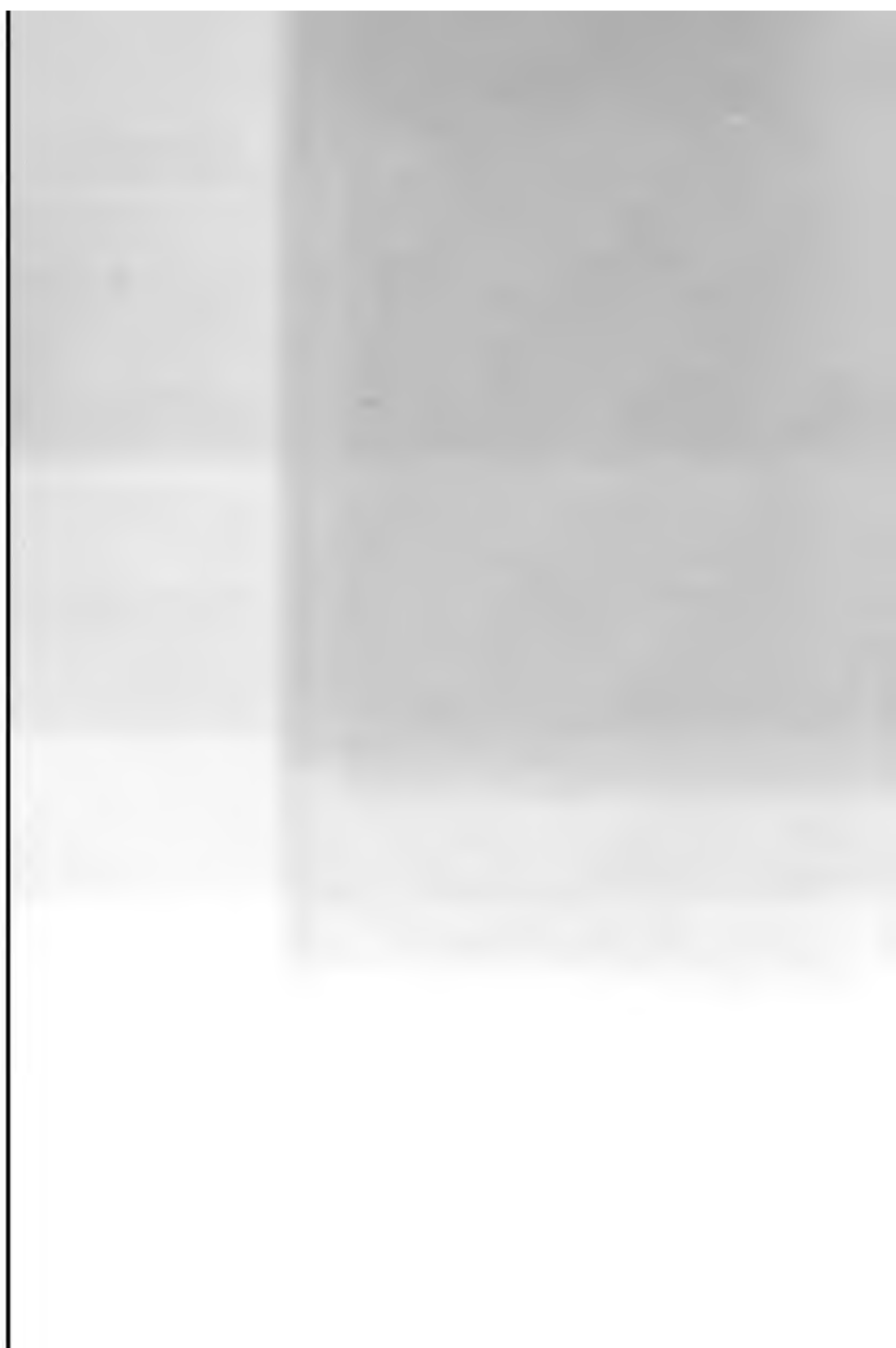


GENERAL VIEW
OF THE
AGRICULTURE
OF THE COUNTY OF
CARDIGAN.



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GENERAL VIEW
OF THE
AGRICULTURE
OF THE COUNTY OF
CARDIGAN,

WITH OBSERVATIONS ON THE MEANS OF ITS IMPROVEMENT.

DRAWN UP

From the Communications of THOMAS LLOYD, Esq.
and of the Rev. Mr. TURNOR.

Gt. Brit.

FOR THE CONSIDERATION OF THE BOARD OF AGRICULTURE AND
INTERNAL IMPROVEMENT.

LONDON:

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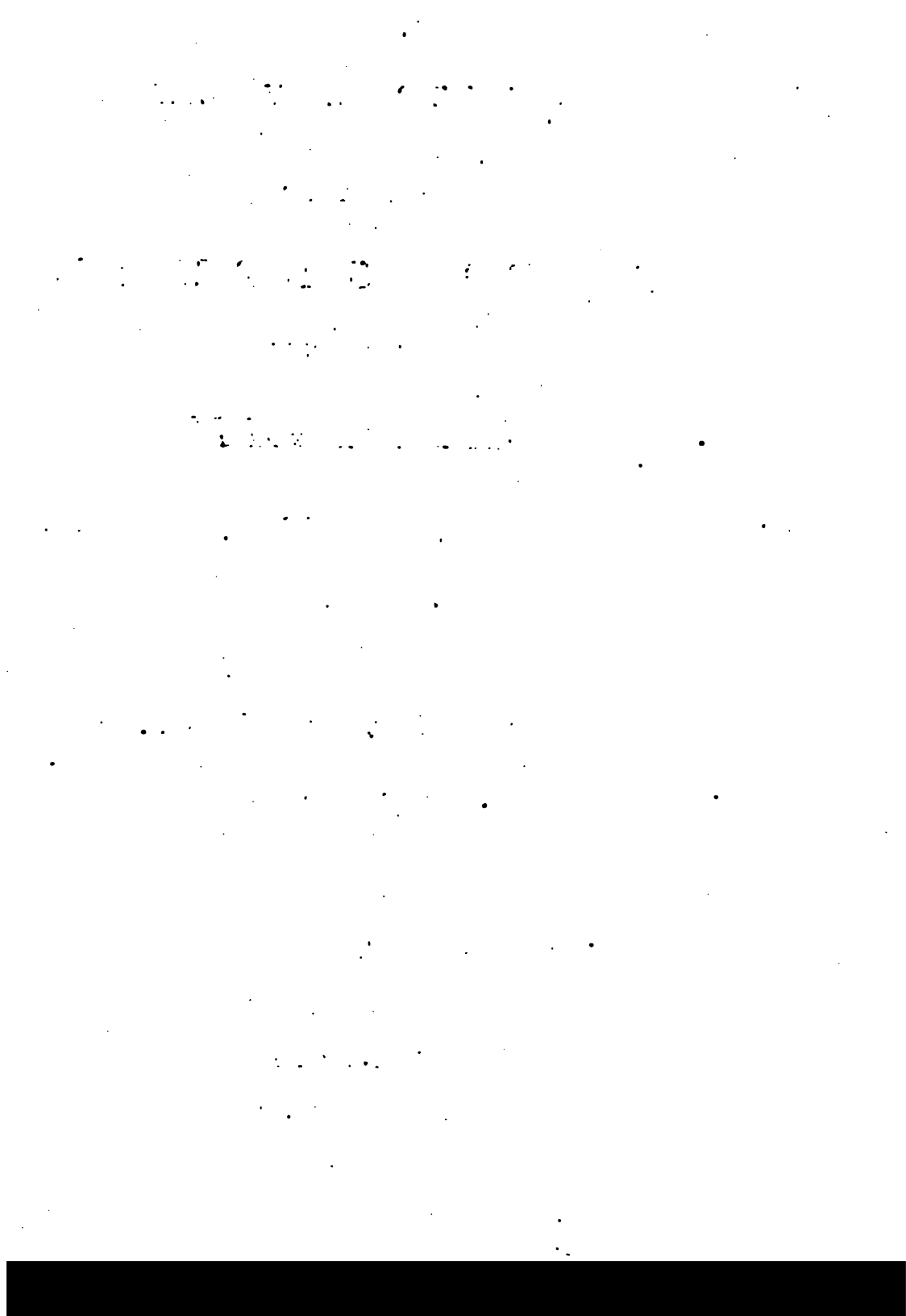


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ADVERTISEMENT.

THE following valuable communication, respecting the present state of husbandry in the county of Cardigan, and the means of its improvement, drawn up for the consideration of the Board of Agriculture, is now printed, merely for the purpose of its being circulated there, in order that every person interested in the welfare of that county, may have it in his power, to examine it fully, before it is published. It is therefore requested, that any remark, or additional observation, which may occur to the reader, on the perusal of the following sheets, *may be written on the margin*, and be transmitted to the Board of Agriculture, at its office in London, by whom the same shall be properly attended to; and when the returns are completed, an account will be drawn up of the state of agriculture in Cardiganshire from the information thus accumulated, which, it is believed will be found greatly superior to any thing of the kind ever yet made public.

The board has adopted the same plan, in regard to the other counties in the united kingdom; and, it is hardly necessary to add, will be happy to give every assistance in its power, to any person who may be desirous of improving his breed of cattle, sheep, &c. or of trying any

TO THE READER.

IT is requested, that this Paper, may be returned to the Board of Agriculture, before the first of March next.

It is hardly necessary to add, that the Board does not consider itself responsible, for any fact or observation contained in these Reports, which, at present, are printed and circulated, for the purpose merely of procuring additional information, and of enabling every one, to contribute his mite, to the improvement of the country.

JANUARY, 1794.

INTRODUCTION.

THE county of Cardigan, is a long and narrow district, about forty miles in length, twenty in breadth, and one hundred in circumference. It contains five hundreds, six market towns, and sends two members to Parliament; one for the shire, and the other for the town of Cardigan. It is bounded by the Irish sea for about forty miles, where great encroachments have been made upon its coasts, even within the memory of man, and tradition speaks of a well inhabited country, stretching far into the Irish channel, which has been carried off by the sea. Of an extensive tract, formerly celebrated for a hundred towns, nothing now remains but two or three miserable villages, and a good deal of ground in high estimation for barley, which is the regular crop without change or intermission. Sea-weed is the manure made use of, and the quality of the grain is such, that it is sent to the adjacent counties for seed corn. For at least these sixty years past, it is said that crops of barley have been annually taken from it, without any cause for complaining of a diminished produce.

River.—The Tivy is the principal river which divides this county from Carmarthenshire. It takes its rise in the hills seven or eight miles above Tregaron, and empties itself into the sea, about a mile and a half, or two miles below Cardigan.

Divisions.—This county may properly be divided into two districts, the lower and the upland. It is necessary to treat of these separately, as they differ so materially from each other. The observations as to the former have been very obligingly communicated by Mr. Lloyd; in regard to the latter, by the Rev. Mr. Turnor.

LOWER

LOWER DISTRICT.

Soil and Climate.—The higher grounds of this district are in general a light sandy loam, varying in depth, from a foot, to four or five inches, the substratum a flaty kind of rock, producing, when judiciously treated, good crops of turnips, potatoes, barley, and clover; the ground in the valleys is very deep, and, with some exceptions, very dry, yielding good crops of hay for many years, without surface manure, which is scarcely ever thought on until it is exhausted and becomes mossy, and then it is turned up. In this hundred, now called Troeddyraur, we have both clay and marle, which effervesces strongly with acids. The climate is much more mild than the midland counties of England, but more humid; at the same time less distinguished for moisture than the west of England, or the sea-coasts of Carmarthenshire and Pembrokeshire. In this part of the country, snow seldom lies long; of late years we have had little or any, and upon the whole, I think the climate favourable to agriculture.

State of Property and Farms.—The land is in general owned by gentlemen from one hundred to one thousand pounds a year, and some freeholders from ten to a hundred. The farms run from twenty to three hundred acres; seldom, though sometimes, more.

Modes of Occupation.—Our farmers are extremely fond of the plough, and seldom suffer the best pasture to remain long unploughed.

When artificial grasses are sown, they invariably make use of red clover or clover and rye-grass. The stock is, black cattle of the Pembrokeshire breed. The English drovers are fond of them, and, until very lately, they found a ready sale, and at a high price; they are hardy, work and travel well,

well, and take on fat kindly, and our best improvement would be to give them better food in winter. All our farmers keep cows for the purposes of breeding, making butter and skimmed milk cheese. At about six or seven weeks old, the calves are weaned, and if there is grass, turned out in the month of May; and for a month or six weeks, oats are given to them in the field. A cow in common, is supposed to fill a cask of butter, weighing about eighty pounds, and double the quantity of cheese. The butter is salted and sent to Bristol, and of late years the price is advanced, to six-pence and six-pence halfpenny the pound, in cask: The cheese at three-pence for home consumption. When the farmer keeps sheep, the ewe's milk is added to the cheese to give it tartness, which the country people prefer to the milder sort. Owing to the spirit of enclosing, the flocks of sheep are considerably diminished, as fatal to young growth in the hedges, but never was a soil better suited to them. We are strangers to the rot and scab, and I should be puzzled to calculate the usual period of their existence, if they were not killed by the butchers, or starved in the spring of the year. The hill sheep are restless, and not easily confined by any fences we can make. They weigh, when fat, about seven or eight pounds a quarter, and when crossed with the Leicestershire or Dorsetshire, double that weight.

Watering Land—With all the advantages of abundant streams and springs, little use is made of water; where it is, the benefit is incredible. As the mode I have adopted, at the suggestion of a very intelligent land surveyor, was new to me, I will describe it, because in hilly countries it may be useful to others. Exclusive of springs upon the hills, there is no valley without a river or a brook, and scarcely a glen, or what we call a dingle, without a stream sufficient to turn a mill. Where I have not a sufficiency, I make a reservoir. From the outlet it runs into the first course, which is made about two feet wide, and three or four inches deep. I will

suppose the first to run about twenty yards upon a dead level; at the end, it is stopped by a piece of board inserted in the earth, and thus upon side-long ground, a complete sheet of water is thrown over it for fifty or one hundred yards, in depth, according to the quantity issuing from the pond or the nature of the ground. For the next course a fall of an inch or two is given, making a kind of a step, to give rapidity to the stream which is to be treated in a similar manner; observing to shave the lower end of the trench that the delivery may be equal and uniform, and for which the water is your best guide. Thus you may proceed as long as you have water and ground, making new water courses one under another. I hope I am sufficiently understood as to the manner; of the effect, I can with truth assure you, I know ground, which four years ago, was not valued at more than five shillings an acre, will now let for five and twenty. When you consider our propensity to ploughing, and the want of spring and summer food for the cattle arising from the system we pursue, you will not be surprised at the high price given for good grass, compared with the prices paid for arable land. I begin watering early in November, or sooner if I can, and continue until the latter end of March; by the latter end of April, it is in a southern aspect sufficiently high for the reception of my cows and calves,

Crops.—The culmiferous crops are wheat, barley, and black oats.

If wheat is the first crop, it is preceded by a fallow; when the wheat is good, they are sometimes (but not often) tempted to take a second. Then two or three crops of barley, and as many of oats, until it scarcely returns the seed grown; but with the last crop, clover seed (if any thing) is sown. The returns are such as might be expected from such treatment, without any other manure than what was originally laid upon the ground for the wheat. When they do not fallow for wheat, they begin in the summer
to

to carry lime, and lay it in small heaps upon a ley field: in autumn they carry dung, and spread it over the field with the lime, and, thus incorporated, the field is ploughed, and in that state remains until the spring of the year. It is then harrowed, and if the soil is light, the seed is sowed under furrow: if the soil is strong, an additional ploughing is given; but it is never crossed ploughed. To the barley, wheat in the following year succeeds; then barley, sometimes intermixed with a crop of grey peas, which is again followed by barley as long as it is tolerable, and oats until they are intolerable; still finishing with clover and rye grass, if any seed is sown. I am sorry, that truth compels me, to make such a report to your board, of the agriculture of this county.

The few who cultivate turnips, find an ample reward in an improved stock, and a crop of barley in the broad cast of four and five quarters an acre. Some sow clover with the first crop, and wheat the following year; then a leguminous crop, succeeded by barley with artificial grasses: others sow barley after turnips, then peas, vetches, or potatoes, and barley with clover; and I am inclined to give barley the preference to wheat, upon the upland ground. When I present to your view any system of individuals, which may operate as an exception to the general practice, it is for the purpose of proving the advantages arising from it, and not without hopes of its being followed by others.

Fallowing.—If ploughing the ground three or four inches deep, and suffering it to remain all the summer, full of couch grass, and other noxious weeds, can be called fallowing, we have fallows.

Manures.—Lime and half rotten dung are the manures chiefly in use. The quantity of lime from three to five cart loads: each cart contains sixteen Winchester bushels, and even this is injudiciously applied, by leaving it scattered over the fields all the summer in small heaps, until the dung

is carried out preparatory to ploughing. Composts are seldom made. The lime now stands us in sixpence a bushel, exclusive of carriage; a heavy expence in a poor country. Marle must be resorted to, and from an experiment made, I am inclined to think we shall gain by the exchange. Upon land similar in soil and situation, turnips in the broad cast were sown and twice hoed, one part manured with thirty-seven loads of dung, and two or three and forty loads of earth from roads and ditches, made into a compost.

Another part with one hundred and twenty loads of marle to the acre; had a third more been added, I should have thought it better for the succeeding crops. The other division, with eighty bushels of lime spread as soon as possible, and turned in with the plough.

The dung and earth produced a very luxuriant crop, the largest turnips weighing fifteen and sixteen pounds, clear of root and branch, and measuring three and four and thirty inches in circumference. The marle and lime not above half the size. The turnips were eaten upon the ground by young cattle and sheep.

The barley from the compost measured thirty-eight bushels an acre, and weighed fifty-one pounds the struck Winchester measure. The marled part forty-two bushels, and weighed fifty-two pounds and a half. The part limed, weighed fifty-one and a half: the account of the measure is mislaid. Wheat upon a clover ley, yields from three quarters to three and a half per acre. In the common practice, from two to two and a half, and the first crop of barley seldom exceeds three quarters.

Implements.—The ploughs are too bad for description. The carts have long and narrow bodies on low wheels, with a beam to which two oxen are yoked, preceded by two horses abreast.

Sowing

Sowing and Reaping.—Wheat is sown from the first to the last week in October; barley about the middle and latter end of April; oats in the beginning. In particular situations they reap the two or three last days of July; very generally the middle of August. Barley and oats are often cut down by a scythe with a cradle; by which means more straw is gained and much labour saved. All the corn is bound, and made up into small mows in the field, where it remains, undamaged by rains, until they have leisure and fine weather for leading in. The mows, when threshed, yield from one to two quarters each.

Inclosures.—Most of the land in this part of the country, is either inclosed or inclosing. Since the peace of sixty-three, considerable inclosures have been made. When the hedges are made of alternate layers of sod and long stones, (the length of stone running towards the center of the hedge) they are very durable, and proof against every thing but sheep. They are formed upon a base of six or seven feet, four and a half or five feet high, narrowing to the top, upon which white and black thorn are planted: in exposed situations their growth is slow. Furze thrive well; but when they come to any size they are apt to shake down the banks of earth, which are not supported by layers of stone. Would it not answer to raise a little mould five or six inches high, and a foot wide at the bottom of the hedge, and sow it with furze seed? That objection would be removed, and I should imagine, by the time you have gone through a succession of crops for four or five years, the fields may be consigned to pasture, and the sheep unable to force a passage. I have this spring tried it about the hedges of seventy acres, and am sanguine in my expectations. I dwell upon this subject in the hopes of seeing our flocks restored, as the sheep is the animal of all others, the most profitable upon this soil. The inclosures vary from six to twenty acres and upwards. The rents are at least doubled within these thirty years.

Population.

Population.—All the old people I converse with are agreed in the increased and increasing population.

Commons.—We have few commons, the largest (supposed to be about two hundred acres) is in the vicinage of Cardigan: it is the property of the corporation and resident burghesses: it is grazed, but never ploughed. A division is wished; but acts of parliament are too expensive.

Rent.—Farms lately set, are taken at four or five shillings an acre; they seldom exceed six in the most advantageous situations.

Waste Land.—We have little waste land, in this part of the county, and none which ought not to yield good crops of barley, oats, turnips, potatoes, or pasture.

Wages and Price of Labour.—Men servants have from one pound five shillings, to six or seven pounds; women from fifteen shillings to three pounds ten shillings. The labourers begin to work on the first of May at five in the morning, and with an interval of half an hour for breakfast, and two hours for the middle of the day, continue until seven in the evening; these are the working hours to the first of August; after the harvest until Michaelmas, from six to six; half an hour at breakfast, and one hour at dinner allowed. In the short days they begin as soon as they can see, and leave off when they cannot. Until last year, they found themselves and families, winter and summer, for six-pence a day; as it was thought too little (and well it might) seven-pence was given in winter, eight-pence in summer. It is true, some gentlemen give them cottages rent free, but the practice is not general; and when they are under tenants to farmers, they pay for their miserable hovels from fifteen to twenty shillings a year. If the farmer finds the labourer in provisions, he pays him two-pence or three-pence a day, for the subsistence of his wife and family.

Their

Their pay bears no proportion to the price of provisions, or the labour they perform. Their chief food is barley bread; and few of them have cows. I believe if an average price was taken for the last seven years, barley in retail has been little short of four shillings a bushel; which, if you advert to the bad husbandry of this country, is not to the consumer nearly so productive in meal and malt, as the English corn; but malt liquor and meat are not within their reach. The salt butter is at this moment seven-pence halfpenny and eight-pence a-pound in retail, skim-milk cheese three-pence and three-pence halfpenny; wool a shilling a-pound, and it is cheaper now than it has been for some years; fuel, one shilling and ten-pence or two shillings a load, and the carriage to any distance enormously dear, generally paid for by labour in harvest, and at the distance of five or six miles, four days work is exacted for the carriage of each load, and each family requires six loads, the time employed in digging the turf and carting, not taken into the account; and if to that, you add the statute labour, bad weather, illness, or want of employment, you will be able then to judge of the real condition of our peasantry.

As the value of land has rapidly increased, fields are cultivated, which in former times supplied the poor with furze, thorns, &c. for fuel. The sea also furnished them with large supplies of food, but the heavy duties on salt preclude the possibility of winter store, which otherwise would not be neglected.

Draining.—Draining is in its infant state; the practice of filling the drains with small stones, covered with straw and earth, may be objected to as liable to choak. I should prefer the drains narrowed to the proper depth. A flat stone of each side coming into contact at the bottom, and widening upwards, supported by the sides, and covered by another flat stone filled up with earth, will bear any pressure, and leave the gutter always clear.

D. 111

Paring and burning is much in vogue upon the lightest and driest soil. As it is done with a mattock, much soil is unnecessarily wasted at the time, and impoverished in future; when burnt, lime is mixed with it, the first crop very abundant, diminishing yearly in value, until thoroughly exhausted. It is then consigned to rest for fifteen or twenty years, in the most beggarly condition, until a sufficient surface is acquired to undergo a similar operation. A practice more fatal to agriculture upon this soil, cannot be adopted.

Woods.—The country has but little wood, and that little is daily lessening, and what is left is much neglected.

Price of Provisions.—Beef, mutton, pork, and veal, are at three-pence a-pound. Soon after Christmas, the price will rise, and in the spring of the year, butcher's meat will be sold at four-pence half-penny and five-pence. Good fowls sell for six-pence a-piece, turkies, half a-crown; fresh salmon from two-pence to six-pence, salted, and dried, from four-pence halfpenny to seven-pence.

Roads.—The roads, both public and parochial, are pretty good, but very injudiciously carried up and down hills, which might in many instances have been avoided, without increasing the cost or distance. Good materials for roads are almost every where to be found.

Buildings.—The farm houses are very bad, and the offices worse; generally placed in the lowest situations, and often at the extremities of the farms. The barns so small, they have scarcely room to thresh with two men. Barns large enough to take in a rick of corn with sufficient space for the threshers, would answer every purpose; as I think the corn is better preserved in rick yards than in houses. A store-house is scarcely to be seen, and when the cattle want straw, the corn must be carried to market, or kept in the house in sacks, subject to the depredations of vermin, and injury of damp.

Lease

Leases.—The leases granted are usually of three lives, the landlord reserving to himself the right of cutting wood, opening quarries, and working mines: The tenant seldom restricted in the mode of culture, and not often in the quantity of lime to be used. I have not busied myself much in calculations of this sort, but general opinion seems to consider three lives, or four and twenty years, as much the same thing in point of duration: But in its consequences to the country and the proprietors of land may differ widely.

It cannot be expected a tenant will go to much expence in marling, or any lasting improvement, with a short or uncertain possession; if the tenure is in years, the three or four last may be employed to the great injury of the land. Security for life gives energy to action, and as few men live so long as they wish or expect, improvements are carried on to the last; hope comforts the tenant, uncertainty the landlord.

Manufactures and Commerce.—There are at Llechvydd, in the neighbourhood of Cardigan, iron and tin works, established about thirty years ago, and now belonging to Sir Benjamin Hammet. I know of no other manufactory in the county of Cardigan.

Oats and butter are our chief articles of export. Barley and malt we often import.

Beneficial Practice.—Our upland ground being so dry and sound, that no animal can, in the wettest weather, make an impression on the surface, and naturally running to white clover and good grafs; when not too much exhausted, it is the practice with many to set apart many acres for *fog*; the expression is I believe provincial, but the process and advantages of the system I will lay before you. As early in May as we can, the fields are shut up for the summer season, with no other attention than eradicating dock, or cutting down thistles, &c. In that state they continue until November or December; when all the stock is turned in, and

every animal is in excellent condition, without the aid of hay, straw, or oats, and the butter is as good as in any part of the year. The frost sweetens the grafs, and snow does not injure it ; but while it is buried, dry food must be resorted to. In the spring of the year, young shoots of grafs are very forward under the shelter of the old, and both together are eaten with avidity. The land which was before mossy, from being overstocked and grazed too bare, is soon filled with palatable and abundant food, and the moss disappears without the aid of the plough, or surface manure ; it betters every year, and I am inclined to think the best acre of hay will not keep more stock, or in such good condition as an acre of fog ; with the additional advantage of avoiding the risk, and saving the expence of hay-making and manure.

The working cattle are housed in the night. Cows, young cattle, and horses, are kept out day and night. It may be urged as an objection to this system, that much manure is lost ; but I would by summer soiling and littering with green fearn, &c. find ample supplies for the arable ground, and by watering and fogging, I want little manure for pasture.

Spirit of Improvement—We have an Agriculture Society in this county, which from the rewards held out to industry, and the zeal and ability of the gentlemen belonging to it, promises to be of very general utility. The efforts of that useful institution, joined to the demand for cattle, corn, and all the produce of a farm, and the high prices they bear, (which it is to be hoped will revive from a late temporary stagnation) are, in themselves, motives sufficiently strong, to excite a spirit of improvement, in a people naturally so shrewd and sensible, as the natives of Cardiganshire.

UPPER

UPPER DISTRICT.

THE neglected state of this part of the county, has long been an object of regret. And notwithstanding the united exertion of many public spirited individuals, its backwardness in improvements is still to be lamented.

Soil.—The soil is various, owing to the unequal surface. In the vallies and dips, it is chiefly a stiff retentive clay, with a gradual admixture of a light loam on the declivities, terminating on the uplands in an uniformly light soil. As the vallies are narrow, and of no great extent, the soil of the county may be termed light: and notwithstanding it is thus pretty uniform in its texture, it is by no means so in productiveness. Situation and shelter make a material difference. Near the sea, though much elevated, and exposed to the north and west winds, they reap near a fortnight earlier, than those situated about two miles inland of them. I do not mean to insinuate that it is uniformly so, as many low spots, more inland, are equally early. The substratum is either a blue slaty rock, where the thinnest and quickest soil is, or a gravelly rab, covering a hard brown rock in no degree calcarious.

Climate.—In a district so backward, it is not easy to know without particular observations, the effects of the climate. Some circumstances (as reapers returning time enough from Herefordshire for our own harvest, and corn being frequently uncut late in October) would incline one to believe it a cold district; but, as much depends on skill and activity, these and similar criterions may prove fallacious. I believe we suffer more from the nakedness of the county, than any elevation of soil. Snow does not lie long, particularly near the

sea, and in the vallies; and on cultivated land, not near so long, as on wastes. I am persuaded it is a much moister climate, than the eastern and other parts of the kingdom, though perhaps not so much so, as the neighbouring county of Carmarthen.

State of Property.—Though there are several proprietors who have very extensive estates in the county, still the yeomanry, possessing from twenty to three and four hundred acres, are numerous; and many of them are occupiers. From this circumstance, one would expect to see the district under a much better husbandry; but I am sorry to observe that these occupying proprietors, are, in general, as backward in their improvements, as any of the tenantry. They are more solicitous to add acre to acre, than to improve what they already occupy. Farms are in general small; there are some of two hundred pounds a year and upwards; but by far the greatest number are under sixty.

Mode of Occupation.—The most common management is that of a mixture of tillage and pasture. Much of the land near the sea, and for about four or five miles inland adjoining to it, is under corn; and also a large portion in the different vales, divided by the rivers Tivy, Ystwith, Ridol and Airon. This county, in one feature, is not unlike the kingdom at large. There is in it a gradual elevation of surface, terminating nearly in the centre, from almost one extremity to the other. It begins about five miles north of Newcastle, to the east of the parish of Troedyrour, and is lost in the bold and lofty hills on the borders of Montgomeryshire. For some miles to the north, it is of no great breadth; but it expands, in some degree, as far as the Airon, where to the north-west, it is intersected by a faithful, though a narrow vale. Thus far, it has a great uniformity of surface, chiefly an extended plain, with many narrow dips, well adapted for plantations. On this backbone of the county there are many scattered farms, situated in the Dips. The
easy

easy declivities and much of the plains near the dwellings are under corn; but the greatest part of it is still a waste, yielding nothing but ling, heath, and moss, its natural productions. After passing the Airon, it takes a bolder stile, more diversified with hills. The declivities are more rapid, and the dips and plains more barren. Were the hills well covered with wood, the climature of the situation would be much mended; and stock and tillage would reap a consequent benefit.

Where no regular system of cultivation is adopted, it is by no means easy to describe the mode of farming. Here every individual pursues his own method. The only similarity in their practice is that of taking three or four crops of lent corn in succession. With the last crop, most now sow from twelve to fourteen pounds of the common red clover an acre, or about two bushels of rye grass, and sometimes a due proportion of both. Too many of the inferior farmers still content themselves with the natural production of a worn out soil.

There are few, if any pasture farms within the county; though many fields, and sometimes whole farms (here called bye-holds) are let for that purpose. When that is the case they are generally detached pieces on farms that cannot be let to the satisfaction of the proprietors. In the eastern part, bordering on Carmarthenshire, from Lampeter, by Tregaron, across the extensive plain of Ystradmeirig to the outskirts of the county, adjoining to Radnorshire and Montgomeryshire, they depend more on their stock than on cultivation. This may be more owing to the distance of that quarter from lime, the chief manure for corn, than any inherent quality in the land for pasturage. They raise less corn than their consumption requires. The rents are paid by the sale of cattle and horses bred on the farms; and on the uncertain profits of detached, and some distant sheep walks on the surrounding hills. The profits of the walks

much depend on the mildness of the winter. The activity of the farmer, and the fidelity of the shepherd, are also of considerable consequence; as the sheep in snowy seasons are most apt to take shelter, where the snow most commonly drifts.

To the south east of this upland division, which has rather an easy, though an irregular descent to the Tivy, there is a considerable extent of inclosed, well cultivated ground; with a larger portion of pasture and good meadow than any other part of the county. The grasses, usually cultivated, are much the same in every division. Indeed, some have introduced in addition to the common clover and rye grass, white clover, cow grass, and plantain; and wherever cultivated on well-conditioned land, the crop is always abundant.

Live Stock.—The stock mostly depended upon is the black cattle of the country—much improved of late years by introducing bulls and heifers from the neighbourhood of Pembroke. They are still capable of very great improvement; and perhaps it would be more to the interest of the county, to attend to the original stock, than to the introduction of any distinct breed. They are small, but well made and hardy, much the same with those in Pembrokeshire and Carmarthenshire. The richness of the land, and, perhaps, a greater attention in selecting the best for stock, has made the only difference. I believe them to be less milchy than most breeds; but as the country in general place more dependance on the drover than on the dairies, this objection may be no great disadvantage to the farmer.

There are but few sheep on the inclosed farms. Their tendency to roving is their only objection. On the best inclosed, a few wethers, bought in the autumn for fattening, if any, is the only stock. Farmers on the uplands, and others in different situations, who pay no regard to their fences, and their other stock, have pretty numerous flocks.

Wherever

Wherever kept, according to the present method, they are a perfect nuisance. Late in the spring, about barley seed time, they begin to look after them. A boy, or a girl, of from ten to fourteen years of age, is the only herd. From that time to the end of the harvest, they are folded in the night, and for about two hours in the middle of the day, whilst the herd has his dinner. The ewes are often milked, a custom not so common as formerly, and at this time, not at all followed in the upper part of the county. The milk, mixed with that of the dairy, makes rather a palatable tart cheese. The rest of the year they are suffered to take their own range. The only trouble then is, to see once a day; or, perhaps, not so often, if they are all to be found; and sometimes, to send a cur after them from the garden, or the best spot near the house.

The sheep walks are under different management. They are there under the care of a grown person, accustomed to the business. A sheep system is totally unknown to the common farmer of this country; indeed, there are some impediments to a right introduction of it. It would be no easy matter to get a grown person, a native, to look after them in the winter time. The bleakness of the situation would be urged as an excuse, though, perhaps, prejudice, as it has been hitherto the employment of children, would be a more weighty consideration in his own mind. A total want of materials for hurdles within a proper distance, is none of the least. Timber is a scarce article in this county: and perhaps, underwood fit for twig-hurdles, not less so. A mere fold is soon procured. A few gate-hurdles fixed in the ground, covered with furze faggots on the outside, is the most common one. As this is in use in summer to confine cattle and horses as well as sheep, I should think the faggots are more used to prevent the sheep from getting out between the bars than for warmth. The hurdling

hurdling of turnips is the great object. A cheap contrivance made of another material is much to be desired. Sheep are very destructive to our fences. A mound made of sod six or seven feet at the base, by four or five high, planted on the top and sides with thorn; and in bleak situations, sown with furze. The quicks have no protection. And as the oily quality of the wool is injurious to the growth, and the trampling of the sheep not less so to the mounds, it is no wonder, during the present scarcity of timber and twigs, that this species of stock should be so universally rejected.

In the upland district above Airon, they are shorn once in the year, about 20th of June. The wool is of a longer staple, and coarser than to the south of the county. It weighs about two pounds the fleece. Many in that quarter bring their flocks down to the low grounds in the winter season. Below Airon, the wool is shorter and thicker on the carcase. There they are in general shorn twice in the year; about the latter end of May, and about the 10th of October. The first fleece weighs about two pounds, and the least, which is only part of a fleece, as the wool on the hind quarters and the tail is suffered to remain, weighs about one pound. The common price is about fifteen-pence the pound. Spinning is common in every family, as most of the inhabitants manufacture their own apparel. What they have to spare is sold in the different fairs and markets. Dealers, who live mostly in the district between Lampeter and Tregaron, buy the coarser sort for the English markets. The rot is not very common, it prevails chiefly on a wet retentive soil; And as to the scab it was totally unknown till the introduction of a better breed from England. The Leicesters and Dorsets are not unknown in this county. A cross with the best of our own is much approved of. The unmixed breed are very small, long legged and narrow on the chine. In the same flock there is a great variety, white, black, and all the intermediate colours. Some with horns, and many without.

without. The hind quarter weighs on an average about nine pounds. The meat is remarkably good; and the kidney well covered with suet. They are certainly capable of great improvement; and as the land is very favourable for that species of stock, the want of a regular system is much to be regretted.

Pigs, though not to be depended upon of late years for profit, make always a part of the farmer's stock. The method of disposing of them is various. Some breed and rear till they are fit for Bristol drovers. Others buy them young and sell them nearly fat at from a year to two years old, to the same dealers. Few, in comparison, are consumed in the county. One or two of a tolerable size will satisfy a substantial farmer. There is universally amongst them an evident partiality for Roof Beef.* Though the want of skill and capital, and some local disadvantages debar them of a due proportion of both these means of sustenance.

Watering.—The importance of watering is well understood. The gentlemen, and most of the principal farmers practice it judiciously: And as every glen has its rill, very considerable improvements might be made by a due attention to it.

Crops.—Barley and oats are the principal grain of the county. Wheat is commonly sown; but in a less proportion than the other two. There is also in the upper part of the county, a considerable quantity of rye. In the upland it is sown alone: but in the neighbourhood of Aberystwith, frequently with a mixture of wheat. The mixture makes good bread, sweeter and moister than that of wheat alone. Those who are used to it, prefer it to any other.

The usual preparation for wheat is a foul fallow, dung and lime: and on new ground, or what has been long uncultivated, beatland and lime, succeeded by oats on new ground, too often till the land is tired. On a ley it is succeeded by barley, oats and grass seeds. Sometimes a crop

D

of

* Roof Beef is a provincial name for Smoked Beef.

of peas intervenes. When peas are the second in rotation, a good crop of barley after them is always expected. Land long in tillage gets tired of oats. On those tracts, barley, peas, barley and grafs seeds are the approved husbandry ; and were the peas drilled and kept clean, this rotation may not be a bad one in part, for the lighter soil. The husbandry of gentlemen is pretty similar in most places. We have here clean fallows, and drilled crops ; with the most approved practice of the best cultivated counties. But as I wish to detail only the common management, I am obliged to add the following rotations : Barley, barley, peas, barley, grafs. Barley, barley, oats, grafs ; and barley, oats, oats. Seed-time for oats commences about the middle of February ; for barley, the beginning of April, and for wheat, the latter end of October. Harvest has not been general of late years, till about the last week in August. About Cardigan, corn is mostly mown. A cradle fixed to the scythe is always used. The whole is bound and made into mows in the different inclosures, sometime before it is conveyed to the rick-yard. Reaping is the most common practice in the other parts of the county. The difference in barley is about five to one in favour of the scythe ; and in oats, about three to one.

Fallows for barley are not common. The general preparation is lime and dung on a ley of five or six years old. The lime is carried on in the summer, and laid in small heaps at the rate of about four ton an acre, (though six is little enough) measuring about sixty-eight bushels. As dung is never to be had in sufficient quantities, many, to extend their ley barley, cover the lime spread, with the soil of the field. Ploughing four or five furrows early in the year, within such a distance to each other as to cover the spot when spread, is the only preparation. A compost of lime and earth, and the scrapings of roads is also made use of ; and near the shore, sea weeds and sand. The former is to be had only in particular

icular places, and in small quantities ; and the latter is too heavy for a distant carriage. There is a general idea that sea-sand is productive of couch grass ; at the same time all allow that it sweetens the herbage. But I should suppose it can have no other effect than forcing to fight the natural product of the soil. The price of lime to those who burn it themselves, used to be in my neighbourhood, which is twelve miles north of Cardigan, about six shillings and three-pence a ton, exclusive of carriage. This year it has been considerably dearer ; at least to the amount of one shilling a ton. To the north, it gradually advances ; and to the south it becomes, perhaps in the same degree, more moderate. The dung and lime are spread soon after the harvest ; sometime before the land is ploughed. Lime is much approved of as a manure. Its effects, on all our soil, is to be seen to an inch. None of the uncultivated wastes can be reclaimed without it. Dung can be applied to a better purpose ; and paring and burning without lime is a bad practice. The ashes alone may throw out two or three miserable crops of oats, though no herbage : but with lime, good wheat, oats and grasses.

To the north of the river Airon, between the uplands and the sea, buck wheat is commonly cultivated ; sometimes for the grain, and not unusually as a preparation for wheat. The soil in this quarter is of a superior quality ; more compact, though not retentive. The various inequality of surface as affording shelter, contributes much to its productiveness. Were the declivities inaccessible to the plough, well covered with wood, this space of the county would be truly ornamental. I am happy to add there are several spirited, improving farmers in it, who well know the value of their situation.

The pea commonly cultivated is of a very inferior sort. It is a small hog pea, not at all productive. Though sown early in February, it seldom ripens till late in September.

Potatoes, as being an article of considerable consequence for culinary purposes, and making up, with barley bread, the chief sustenance of the poor, are here universally cultivated. A few years ago a large portion of what were used, were annually imported from Liverpool. Of late the quantity has been inconsiderable; and those imported are brought up chiefly for a change of feed. Turnips, vetches, and other meliorating crops are not common. The importance of them, as the basis of a spirited husbandry, is well known to some individuals: But the universal introduction of them must much depend on the persevering practice of those, who already know their value.

Implements.—The implements of husbandry are scarce on a par with the wretched management I have already described. The plough and cart are particularly faulty. The cradle of the plough is of unusual length, measuring, including an ill made blunt share, at least five feet. The mould board is only a round piece of wood, measuring in circumference about seven inches. In working, not near half the cradle touches the ground. The tail is continually held up by the ploughman, by short awkward handles. And when best at work, it is held in a very oblique position. The only method of setting it is by wedges. The cost of it is about fifteen shillings. With such an implement it is no wonder the furrow is not laid flat. The surface of the fallow is uneven, making with the assistance of the dung and lime, a chequered appearance of a variety of colours. A ley is a full draught for four of our beasts, a yoke of oxen, and a pair of horses, each abreast. The carts are small and heavy. The wheels in height, four feet six inches. Buck in length, five feet ten inches; breadth, two feet ten inches; depth, one foot three inches and a half; it carries about sixteen bushels; and is drawn by two oxen and two horses abreast. The tract of the wheels four feet three inches in the clear. For carrying hay, straw, faggots, wood, &c. a kind of a
car

car with a beam is used, in shape like the buck, but larger ; open at each end, and not boarded. The same pair of wheels do for the buck and car. They are shifted as occasion may require. The cart complete costs seven pounds. The harrows and the other implements are not unlike those used in better cultivated counties. All the implements are made on the spot ; and the farmer has to procure all the materials. Oxen are less used than formerly. In the neighbourhood of Aberystwith, horse carts are very common.

Inclosures.—The greater part of the low lands is pretty well inclosed ; but hilly and exposed situations are mostly open. The size of the fields depends much on the extent of the farms. In general they are from six to ten acres. The only tract like a common field is an extent of very productive barley land, reaching on the coast from Aberairon to Llanrhyfed. This quarter is much intermixed, and chiefly in small holdings.

Inclosing, without a consequent improvement, is of little advantage. When both go hand in hand, the benefit is considerable. Population, as well as product, are much increased by it. An engrossment of farms in an improved situation, totally dependant on stock, or the dairy, may in some measure discourage population ; but in an improving district, or where much cultivation is required, the result must be quite the contrary : at least, it has been invariably so in this country. An instance may be more to the point than reasoning ; and as the particulars of my own farm are more within my own knowledge than other holdings, that are perhaps a greater object of a statement, I shall at present refer to it. The spot I allude to, consists of three hundred acres. Ten years ago it was in the occupation of two, in pretty equal divisions, giving but a scanty maintenance to only two families of twelve persons. Ever since that time, it has given employment and maintenance to seven families, living on the spot, consisting (including children),

children) of thirty-three persons; besides four or five labourers, in the neighbourhood, who have constant employment. The same may be said of every other improving spot; as nothing has been attended to here more than the necessary business of a common farmer. Within the memory of a labourer, who is now but sixty-three years of age, there were only two carts in the parish: sledges were then the only carriage. They did little more than to convey some small quantity of dung to the adjoining spots. Lime was unknown; and sea sand, the only distant manure, was carried in bags on horses. There are now in the same parish fifty-three carts.

Waste Land.—The wastes unfriendly for cultivation, are very extensive; and including the tracts only particularly cultivated, may amount to near half the county. Almost every spot is capable of improvement. Where the plough cannot answer, plantations would be very advantageous.

Draining.—This mode of improvement was but little attended to till of late years. What has been done, where properly executed, answers very well. Stones are every where the only material. In most situations, they are to be had at an easy carriage. And although every farm requires much to be done, still the loose pebbles, with the assistance of quarries, would furnish a sufficiency. There is an extensive plain on the river Tivy, extending from Tregaron by Ystradmerig to Strata Florida, that calls loudly for such an improvement. At present it is of very little value, producing only some scanty herbage on its margins, and some excellent peat; the only fuel of the neighbourhood. As it is much on a level with the Tivy, a total drainage may be attended with difficulty. Something might certainly be done by deepening and widening the river: but a change of course might be of greater advantage. In some places, the margin to the sound land may be the lowest situation; where so, an open cut, extending

tending with the river to the south may be of service. A spirited cultivator near Tregaron has done much by open cuts. On the coast beyond Aberystwith, bordering on the river Dovy, there is a similar extensive tract, that, for a total drainage, is perhaps subject to a greater disadvantage. There are others of less extent in various situations: but as they are in the hilly parts, and the dependance of the surrounding families for fuel, there may not be the same inducement for reclaiming them.

Price of Labour.—The earnings of the poor are certainly of late years inadequate to their expences. Six-pence from about the third week of October to Candlemas, and eight-pence the rest of the year, are the usual wages, in this neighbourhood, for common labour. About Aberystwith, and in most of the upper district, they are higher, to the value of two-pence, or more, a day. The number of people employed in the mines, perhaps, makes the difference. Barley bread and potatoes are their chief sustenance, and sometimes a few herrings in the autumn, when they are moderately cheap. Barley, of late years, has been at a very uncertain price. Cold seasons are here unfriendly to cultivation: warm summers and moderate rains suit best our soils. In the winter quarter in scarce years, barley is always under par for the rest of the year: two causes may be assigned for it—the poverty of the farmers, and their want of a storehouse.

From Michaelmas to Christmas is a time of the year when there is a considerable demand on the farmer. He has his rent, manure, and servants wages to pay; and as what he has pocketed in the course of the season from the sale of stock, is by that time expended on other occasions, his poverty too often compels him to an expedient for satisfying those demands; which, if often practised, must in the end prove his ruin. Besides the loss of fodder by thrashing his corn in an untimely season, he is too often obliged

obliged to replace the grain he sells, and that frequently at the immoderate expence of more than fifty per cent. Were part of the grain then sold withholden till the scarce time of the year, the price might be better kept on a par, the indigent better supplied, and the dealer better paid for the use of his capital, than by the looked for profits of uncertain markets. Lime stones and culm are a very heavy demand on the county; and as we have neither nearer than Milford Haven and the Van Hills in Carmarthenshire, the sum expended on those articles is centered in the two adjoining counties.

Buildings.—The farm houses are, almost without any exception, placed in the very worst situations for conveniency and profit. Water and shelter must have been at first the only motive; and as levelling, and the improvement by irrigation, were little understood till of late years, and the land, excepting the best spots, a mere waste—this universal partiality for the lowest spot, is easily accounted for. And though an up-hill carriage, where it can be avoided, is now deservedly thought an unnecessary waste of labour; and the loss of the best dung by landfloods and rivulets, as justly considered a useless consumption of manure; still these disadvantages are not always duly attended to.

Any single building in tolerable repair, is a sufficient motive for placing a dwelling, or any new erection, on the old spot. And as the repairs, and similar expences, are too often the burden of the farmer, it is no wonder that present conveniency should be so often sacrificed to any distant profit. The dwelling is, in general, mean; consisting only of two rooms on the ground floor; and some inconvenient recess for dairy, pantry, &c. The two rooms are mostly taken up with beds and other furniture, that decency requires separate apartments for. The fevers, and some local illnesses, that the middling, and the lower class of

of the inhabitants, are so much subject to, are chiefly to be attributed to these inconveniences.

The improved farm house consists of two rooms and a staircase on the ground floor in the front, and a narrow lean-to behind, divided into a dairy and pantry. The up stairs is divided into three rooms, with an addition sometimes of two narrow inconvenient strips over the lean-to. But the conveniency of the second floor is often given up to store their corn in, through the want of so necessary an accommodation in more proper situations.

The other buildings are a barn, a stable, a beast house, and a cart-house. As the corn is always stacked in the rick-yard, a large bara may be unnecessary; but on any extent of holding, two would be a great conveniency. Fodder might thereby be more advantageously expended; and a more unmixed sample of grain might be produced at the different markets.

The necessary attendance on horses is too much neglected. They are generally after a hard day's work little thought of. In the winter, a scanty fare of hay, or a due proportion of barley straw or pea haulm, till about eight o'clock at night, and afterwards pasturage, with the addition of fodder in the morning, is, with the common farmer, the usual allowance. In the spring of the year they have a small quantity of oats. That they do pretty well on such treatment is the best panegyric of a Welch horse. More roomy and convenient stables might be some inducement to take better care of them.

A beast-house is a conveniency, that in this bleak situation, and in the present unimproved state of the county, the farmer cannot dispense with: and as it is the best means for husbanding fodder, as well as the best contrivance for increasing the yard manure, the use of it may be rather recommended. Barley and oat-straw are the common fodder

for cows and young stock. The latter is esteemed not much inferior to hay ; and is given with it to working oxen.

Means of Improvement.—Improvements in agriculture have been but slow in most counties. Something may depend on the turn and activity of the inhabitants ; but much more I should apprehend on the local advantages of their situations. In the last respect, the county of Cardigan is particularly unfortunate. The towns are small, and the inhabitants independent on agriculture, but few in number. The markets therefore for the unconsumed commodities are all at a great distance. The black cattle are all taken to Kent and Essex ; the pigs and salt butter to Bristol ; and the barley and oats to Bristol and Liverpool. And as the different articles are attended with heavy expence in taking to market, and the dealers justly entitled to a due profit for their trouble and capital, the sums thus expended are a considerable tax on the farmer, in comparison of districts more advantageously situated.

Something might be done perhaps, to obviate in part, these inconveniences ; but as the object I have in view is too much out of my way to particularise its different advantages, I must content myself at present with only a bare mention of it, and with full hopes that others, who are more competent judges of the subject, will enlarge on it.

The present most immediate communications with Ireland, are confined to the two extremities of this part of the kingdom. The nearest road to Holyhead from the capital, is two hundred and seventy-four miles and three quarters ; and the other to Milford, is two hundred and forty-six miles ; and to a more central place in this county, called Newkey, only two hundred and thirteen miles. This inlet of the sea is supposed to be a situation well adapted for a direct communication with Wicklow and Dublin.

Dublin. Ships of considerable burden might come in thither; and with the assistance of a pier, might ride safe in all weathers. The pier might be made at an easy expence. The materials are all on the spot. Besides the advantage of a public road, something more might be expected from such a communication. A growing population and increasing commerce, would of course be the consequence. At present, we have no place of safety for ships any where on the coast. Cardigan, Aberystwith, and Aberrairon are equally dangerous.

By the means of a pier at Newkey, many useful lives might be saved; and perhaps the expence of it to government would be more than compensated by a consequent addition to its revenue.

In a county so void of all internal resources for improvements as this is, every additional expence on the expedients used for that purpose, is a sure check to cultivation. A teal of lime may be purchased at the kilns in Carmarthenshire for seven-pence. The same quantity will cost in this neighbourhood something more than two shillings and six-pence. The expence of the stones, culm and freightage is certainly not to be avoided: but could the additional charge of duty on the culm be any way liquidated, the benefit to this county, of such a measure, would be considerable.

By a person well skilled in rural œconomicks, something might be suggested to the different proprietors: but from one whose pursuits in that way are confined to mere convenience, little on the subject is to be expected. However as hints, ever so trifling, may prompt the experienced to a more important detail, I will submit the following remarks as deserving of some attention. On every extent of property, the farm-houses are almost always placed at the extremity of the different holdings. A judicious division of the land between the several occupants, according to their rent,

would, in a great measure, cure that inconveniency, without the expence of new buildings.

A due attention to the property of a new tenant may also merit consideration. It is an old error in this country, to offer for farms much beyond the reach of capitals. The landlord, as well as the tenant, is of course injured. The land is neglected, and the tenant dispirited; and by way of consolation, he, too often, has recourse to drinking and idleness.

The usual expedient in such difficulties, is, to re-let a good part of his holding to different under tenants; and as they have their respective portions at an advanced rent of two or three shillings an acre, the consequence must be a general disadvantage. The conveniency of keeping a cow by labourers is not what I refer to. Such accommodations I would wish to see more general. Where the poor have so little of the comforts of life, the addition of milk, to their coarse and scanty fare, must be a great assistance.

Small holdings may also have their advantage; particularly in a country, where the class with inferior capitals make up the majority of the inhabitants: and were they let by the principals, in proportion to the rest of the land, according to the quality of the soil, and not made a conveniency of by the upper tenant, to assist his own capital, or to indulge him in his inactivity, a more general advantage might reasonably be expected.

The repairs, and other outgoings, that contribute only to the means of carrying on business, are too often the lot of the incoming tenant; and where so little attention is paid to such conveniences as in this country, the burden is often considerable. The farmer's capital may be little enough for the mere business of farming; he therefore is confined to one of the following alternatives: to lay
out

out more than he can afford on the farmery, or to confine his capital to stock and manure; both, in the result, a sure check to improvement.

The conveniency of comfortable and necessary buildings, gates, and fences, is of as great consequence to the farmer, as a good shop, and an eligible situation, may be to his brother tradesman in a more enviable station. It may be replied, the farmer has his allowance in an easy rent, &c. when there is a sufficient surplus of property, such conditions may be of mutual advantage: But to a farmer, who has no more than a bare sufficiency for his business, any diversion of capital is a loss not easily repaired.

F I N I S.



GENERAL VIEW
OF THE
AGRICULTURE
OF THE COUNTY OF
CARMARTHEN.



GENERAL VIEW
OF THE
AGRICULTURE
OF THE COUNTY OF
CARMARTHEN,

WITH OBSERVATIONS ON THE MEANS OF ITS IMPROVEMENT:

BY

CHARLES HASSALL.

Gt Brit

DRAWN UP FOR THE CONSIDERATION OF THE BOARD OF AGRICULTURE AND
INTERNAL IMPROVEMENT.

LONDON:

PRINTED BY W. SMITH.

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ADVERTISEMENT.

THE following valuable communication, respecting the present state of husbandry in the county of Carmarthen, and the means of its improvement, drawn up for the consideration of the Board of Agriculture, is now printed, merely for the purpose of its being circulated there, in order that every person interested in the welfare of that county, may have it in his power to examine it fully before it is published. It is therefore requested, that any remark, or additional observation, which may occur to the reader, on the perusal of the following sheets, *may be written on the margin*, and transmitted to the Board of Agriculture, at its office in London, by whom the same shall be properly attended to; and when the returns are completed, an account will be drawn up of the state of agriculture in Carmarthenshire, from the information thus accumulated, which, it is believed, will be found greatly superior to any thing of the kind ever yet made public.

The board has adopted the same plan, in regard to all the other counties in the united kingdom; and, it is hardly necessary to add, will be happy to give every assistance in its power, to any person who may be desirous of improving his breed of cattle, sheep, &c. or of trying any useful experiment in husbandry.



TO THE READER.

IT is requested, that this Paper, may be returned to the Board of Agriculture, before the first of March next.

It is hardly necessary to add, that the Board does not consider itself responsible, for any fact or observation contained in these Reports, which, at present, are printed and circulated, for the purpose merely of procuring additional information, and of enabling every one, to contribute his mite, to the improvement of the country.

INTRODUCTORY ADDRESS.

THE land owners and occupiers of the county of Carmarthen, are requested to peruse the following sheets with candour ; and to recollect, that in a work of this sort, perfect accuracy is not to be expected.

Those gentlemen who discover any thing in this report, materially differing from their own ideas, will have the goodness to consider, that general and not local observation, has guided the execution of it.

The slow progress of agricultural improvement in this county, makes some gentlemen despair of its being carried to any considerable length during the present age. For their comfort let me remark, that the perfection to which farming and breeding is arrived in the midland counties of England, was established in the course of about twenty years in this present century, by the laudable exertions of a few intelligent individuals, without any extraordinary aid or patronage.

May not the county of Carmarthen, look forward with the fullest confidence of similar success, when it is considered that the great natural advantages it possesses, will be brought into action under the fostering care of the most liberal, re-

spectable and public spirited institution, that ever was established in this or any other country, for promoting the prosperity, exciting the industry, and establishing the happiness of a nation.

That the land-owners and occupiers of Carmarthenshire, may be among the foremost to feel the happy effects resulting from the vigorous exertions of the National Board of Agriculture, is the most earnest wish of their

devoted and obedient servant,

CHARLES HASSALL.

Eastwood, near Narberth,

Dec. 30th, 1793.

SITUATION AND EXTENT.

CARMARTHENSHIRE is bounded on the South by Carmarthen-Bay, West by Pembrokeshire, North by Cardiganshire, and East by Brecknock and Glamorganshires. It is reckoned 48 miles long and 25 broad, containing 512,000 acres.

Ports.—The principal ports are, Carmarthen, Laugharne, St. Clears, Kidwelly, Lanelly, and Loughor Rivers, which is the Eastern part of the Carmarthenshire coast, next to Glamorganshire.

Market-Towns.—The Market-Towns are, Carmarthen, Kidwelly, Llanelly, Laugharne, Llandilo, Llandovery, and Newcastle-Emlyn.

Surface of the County.—The general surface of the County is hilly; and in the Northern and Eastern parts, the hills rise into mountains—the Vales are, for the most part, narrow, and the hills rise very abruptly from the skirts of small vallies, by which this district is almost every where intersected.

Water.—Great plenty of Water is found throughout the district, which issues from the mountains and from springs in the sides of the hills; and from these sources of supply, twenty-eight rivers and streams are formed, capable of turning mills, &c. The principal River is the Towy, upon which stands the sea port Town of Carmarthen, at the distance of twelve miles from its mouth. At Carmarthen the fine Vale of Towy commences, and extends about thirty miles up the country, carrying a breadth of about two miles upon an average.

The Vale of Towy.—The Vale of Towy contains several fine ranges of flat land on the banks of the River; and also a great deal of land rising into easy swells—a few hills raise

their heads to a considerable elevation, from whose summits the beauties of the Vale are viewed to great advantage; Grongar-Hill and the venerable ruins of Dynevor-Castle, are situations from which the eye is delighted by the richest prospects the imagination can form; the country hereabouts is better wooded and better cultivated than almost any other part of the county, owing to the number of gentlemen's seats with which this neighbourhood abounds.

Soils.—In describing the Soils of this District, I shall divide the Lands into three Classes; namely, Vale Lands, Uplands, and Moors.

Vale Lands.—The Vales in general, and the Vale of Towy in particular, consist of a rich loam—the sub-stratum is a dry gravel; sometimes a brick earth; and sometimes clay—the swells in the Vale of Towy consist partly of a good loamy soil upon a brick earth, a clay, or a strong sub-stratum.

In some of the smaller Vales are found Turbaries and wet rushy Lands.

Upland.—The Uplands include the great body of the cultivated farms in the district, and are almost universally employed in mixed husbandry—the soil a grey loam, of a lighter or heavier texture, according to the nature of the sub-stratum.

A light grey loam is almost every where found upon a slate, rabb *, or rocky bottom. A stronger loam lies upon a brick earth, a clay, or a mixture of clay and gravel. A vein of reddish loam extends from about Kidwelly, across the county to the borders of Pembrokeshire. Its sub-stratum is a friable red rabb; and this soil is in an eminent degree favourable to the production of Corn and Grasses—

* Rabb is a provincial term for a slaty kind of rock, which lies under the surface of a large portion of this county.

Equally

Equally grateful to the plowman or grasper, when treated with proper attention to its improvement.

Climate.—The Climate of Carmarthenshire differs materially in the Southern and Northern parts of the county. The Southern parts, lying exposed to the sea breezes, are temperate; the frost seldom continues long, and snow lies but a short time upon the earth, unless a severe north-east wind prolongs its stay; which very seldom happens for any length of time.

The Northern parts are subject to a severer atmosphere, owing to the extent of mountainous country lying thereabouts, on which the snows frequently lie for a considerable time, and chill the air around them to a certain distance. Even in the celebrated Vale of Towy the air is very cold, whilst the neighbouring mountains are capped with snow, although the influence of the noon-day suffers it not to remain long in the Vale.

Rains.—The air is extremely moist, and the Rains prevail to a very great degree.

Proprietors.—The Country is divided among a numerous body of Proprietors: Lord Dynevor; John Vaughan, of Golden Grove, Esq. and James Hamlyn, of Edwinsford, Esq. are reckoned the most considerable Land-Owners.

A numerous body of gentlemen of less fortune, and a respectable class of freeholders (who mostly occupy their own Lands) make up the remaining Proprietors of Carmarthenshire.

Farms.—In several parts of the district there are Farms of considerable extent to be met with; some of three, four, or five hundred acres; but the great mass of country inclosed and tenanted, consists of very small farms of from one hundred acres down to thirty; and perhaps fifty or sixty acres may be taken as the average of a very large majority of the Farms in the county of Carmarthen.

Lands how employed.—The Lands are generally employed in mixed husbandry; every Farmer having dairy-stock, breeding-stock of cattle and colts, and also a portion of their Farms in tillage.

Flocks of Sheep are kept by those whose Lands lie contiguous to, or near the hills; but not many breeding flocks of sheep are kept by the Vale or Upland Farmers, who live at a distance from uninclosed sheep walks.

Grasses.—Little attention is paid to the cultivation of Grasses. Clover and Rye-Grass are sown by many persons; but the Land is generally so exhausted by tillage, and a long train of Corn Crops before these Grasses are sown, that we seldom see a good crop of this mixture—the natural grass of the country, is chiefly white dwarf clover and bents on the Uplands; and Crested Dog's-Tail, Meadow Fox-Tail, and a few others of the Meadow Grasses in the Vales, particularly where the Lands have the advantage of being sometimes overflowed by the Rivers.

Watered Meadows.—Many occupiers of Lands, whose situation admits of making Watered Meadows, are become attentive to that valuable mode of improvement; and the increase of Watered Meadow Lands is conspicuous of late years throughout the district. Its advantages are generally known. However, there yet remains a great deal to be done in this branch of Husbandry, and many advantageous situations lie neglected, owing to the want of skill, industry, or ability of the tenants, to effect the necessary work for applying the advantages nature has given to their Lands.

Ponds.—Pond-making seems to be far behind-hand among them, without which much of the advantage of Watering is lost, as the muck and other manure washed down from the Roads and Hills in the Summer Season, cannot be detained for want of Ponds and Reservoirs.

Grains.

Grains.—The Grains sown in the district are, Wheat, Barley, Rye, Pease, and Oats.

Wheat.—The Climate is not found favourable to the growth of Wheat. Except in the Vales, the South part of the County, and in Laugharne Marsh, which is a strong loam. We seldom see a good sample of Wheat in the District; and the quantity grown is not sufficient for the consumption of the inhabitants, who import considerable supplies of Wheat from England *.

Barley.—Barley succeeds better, and produces good Crops in bulk, but generally ill-coloured, and frequently thin-bodied, owing to bad harvests and damp seasons for opening and filling the Grain.

Oats.—Oats constitute the most profitable Crop upon the whole, in this District. Large quantities are exported annually to Bristol and other Markets. The quality but indifferent, as the Dealers make very little difference in price between a good or a bad sample; and very little attention seems to be paid by the generality of farmers, as to the Seed or Soil of this Grain.

Crops.—There does not exist in the general Husbandry of this County any regular rotation of Crops. The general practice of Farmers seems to be that of sowing such sorts of Grain, as they think the state of the soil will produce; and they seldom omit following the course of tillage until they find the Land will not produce any more.

In some parts of the County Fallowing is practised, particularly the Southern parts.

* It is to be understood, that the moisture of the Climate is the objection to raising Wheat Crops, which do not succeed well in very wet Seasons; but I have noticed very excellent Crops of Wheat, in every part of the County, in Seasons favourable to its growth and harvesting.

Under Fallow Management the Course is :

Wheat

Barley

Pease or Barley—Of late years Pease are not much used, and instead of the second Barley Crop, they sow in some instances Oats.

Oats as long as the soil will bear any. It may be expected that some account should be given of the Land after this treatment : It is left to recover (as the people here term it) for ten, fifteen, or perhaps twenty years; during the first six or eight years of which, upon light Upland Soil, it produces nothing at all; a few miserable bents and feeble weeds excepted. It is no uncommon thing to see more than half the surface of a good Carmarthenshire Farm in this deplorable state.

Some Farmers manure the Ley with Lime and Dung, give the Land one ploughing only, and sow Wheat on the Flag or Furrow, harrowing it well to cover the Seed, and pulverize the Soil.

At other times the Ley being manured in the Autumn, is ploughed and left in that state till the month of April following, when it is sown with Barley at two earths, and as many succeeding Crops as it will bear.

Fallow.—Although these absurd and injurious practices are pursued by the majority of Husbandmen in this District, there are some to be found in it, whose methods are less injurious; contenting themselves with three successive Corn Crops at one course of tillage: and laying down the Land in such condition as sometimes produces tolerable Grass Crops afterwards. The course with Farmers of this description is

Fallow for Wheat

Barley

Oats

Clovers and Rye-Grass.

Laugharne

Laugharne Marsh.—A considerable tract of Land, lying near Laugharne, is embanked from the sea, and is called Laugharne-Marsh; upon which a tolerable regular course of Husbandry has been long established—this Land is ridged up in ridges of about twenty-feet wide, and as high as the soil will bear; so as to let the water fall into the Reans, and thence to the adjacent Drains.

The usual course of Tillage is,

Manure upon the Sward, plough and sow on the Flag.

Wheat,

Horse-Beans,

Barley—at three earths.

Sometimes a Crop of Oats succeeds the Barley; but this is not the general practice—the Land is commonly left to lie in Barley stubble, without any grass-seeds, and it soon recovers its Sward, and produces good Crops of Hay and Grass. It is a sandy loam, with a sub-stratum of rich clay, produced originally, as I imagine, by the over-flowings of the adjoining river Tawe, and the admixture of sea sand, carried over it by the influx of the tides.

The singular fertility of this Soil makes it an object of much concern to the Proprietors, that the Drains should be well attended to, by regular annual cleansing, which seems of late to have been rather neglected; the Water in the Drains stands at present higher than it ought to do from the nature and situation of the Lands; and will, if not timely attended to, prove materially injurious to the property, which belongs principally to George Penoyre Watkins, Esq. and Lord de Montalt.

Green Crops.—I observe an increase in the quantity of Green Crops in this District, among the Gentlemen; but, very few of the Husbandmen are got in the practice of cultivating Cabbage, Turnip, or any other green-winter Crop.

Manure.—The general manure is Lime, which is found in the Southern and South Eastern parts of the District, and

is carried to the remotest parts of it, Northward and Westward—indeed, part of the County towards Llanboidy and Llanvallteg, is supplied with Lime from Pembrokeshire. There seems to be very little skill in the general application of Lime as a manure, particularly in those parts of the county which lie the most remote from it—the Lime is frequently laid in small heaps upon ley ground, or in Land sown with Oats; where it lies several months before it is spread upon the surface and then it has more the appearance and texture of Old Mortar Rubbish, than of Lime. The country most remote from Lime, abounds with very excellent Marle in many situations.

Bog Soil and Ferne, which are known to produce fermentation, when properly combined, are also in abundance in those parts of the County.—As there are many Gentlemen of enlightened minds resident in the parts alluded to, I hope to find, in the future publication of this Survey, some ingenious and satisfactory reasons, why none of these natural manures are not made use of, in preference to sending to a great distance, at an immense expence, for Lime.

The way of applying it is contrary to all principle; and unless some advantages are found by extensive practice to result from it, I humbly conceive Landlords would do well to endeavour, by all means in their power, to correct a practice which appears so very absurd. May not Lime be used to much greater advantage by mixing it hot with Bog-Stuff, Ditch-Earth, and Road-Shovellings?—I observe very little attention paid to the making of Dunghills in any way; Farm-Yard management is a thing about which the Carmarthenshire husbandman seems not to have bestowed a thought.

Plough.—The Plough used in Laugharne-Marsh is a most excellent one, called the Dutch Plough.

A broad wing or firm share, with a long taper point, circular traversing coulter, curved earth-board, single tail, and

and a sliding gauge to the beam, to regulate the depth of the furrow, with a swivel at the point of the beam, to regulate the width, is a construction of plough particularly well adapted to a sandy loam, rendered sufficiently adhesive by an admixture of river slime.

The Ploughmen do their work very neatly with this Plough, laying up their lands, and clearing their reans, with singular dexterity.

Several kinds of Ploughs have been introduced; but there does not seem as yet to be any one that has taken a decided preference in this district; perhaps no good one has found its way hither; the light Plough of Brecknockshire is used by some; and the Herefordshire, a heavier Plough upon the same plan, by others.

Probably the plough used on the Shropshire side of Montgomeryshire, and called there (to the best of my recollection) the Lomax plough, might answer better throughout this county than any others.

I have seen as neat work done with these ploughs as could be wished, on lands as nearly similar to the generality of Carmarthenshire, as can be imagined. Stones are found to obstruct the ploughs of all countries; therefore the objection made by people of this district to wing share ploughs, holds good every where. The fact is, very little pains are bestowed by the generality of farmers in clearing the stones from their arable lands; and we often see more expence incurred by the wear and tear of ploughs and harrows, owing to stones, than would clear the land completely from those incumbrances.

The Plough of this district is as awkward a thing as can be imagined—a share like a wedge—a straight stick instead of an earth board—and altogether ill-contrived, and unfit for the purposes of neat ploughing. I do not recollect to have seen any where such bad ploughing as is commonly observable in this and the neighbouring county of Pembroke.

Harrows.—The common Harrow of the district is not better than the plough.—It does not pulverize the soil without excessive labour, and going over the ground ten or twelve times in a place. I apprehend the Crabb Harrows of Suffolk would do the work better at three or four times going over than these do at ten or twelve; and the introduction of them may be a matter of much advantage to this district.

Carts.—The common Weich cart is a bad one, but of late years a very excellent sort of cart has been introduced among the farmers about Llandillo, and is getting into general use in that part of the county—the wheels are well set, so that the weight lies upon a perpendicular spoke—the body short and broad; and of a curved form, so as to give the load a tendency towards the axle-tree—the body answers the purposes of carrying manure, coals, &c. and with the addition of a thrippl, it serves for carrying hay and corn. This well-contrived cart is, I understand, getting more and more into use; and as a better sort of carriage for farm purposes in this hilly country can hardly be contrived, it is hoped the intelligent farmers in every part of the district will adopt it.

These carts are drawn by three horses, one in the shaft, and two a-breast, which seems to be an advantageous method of using them.

Since the introduction of turnpike roads, the husbandmen of this county prefer using horses instead of oxen in their carts for going long distances, which they think answers better, and seems to be an improvement in the rural economy of this district; the old method of working two oxen and two horses in a team, still prevails in most parts of the district, more or less; and in all strong work upon a farm, or near home, the ox seems to be an useful draught beast.

The oxen work in a yoke in pairs, and the horses abreast before them. Some gentlemen work their oxen lengthways in harness, which is said to answer very well; but

the expence of equipping an ox team in this manner, seems to bar its being brought soon into general practice.

Waggons.—Waggons seem ill-calculated for the business of farming in most parts of the county; a few are kept by gentlemen of fortune, and the carriers upon the great roads use them.

Hedging Tools.—The hedging tools are convenient enough, and the labourers work up the sod facing of the hedges very neatly. The reaping-hook is not so expeditious, or so capable of making clean work as the sickle, but the former is still in common use here.

Seed Time and Harvest.—The usual times of sowing the different grains raised in this district are,

Wheat October, and early in November.

Beans February, early in the month.

Peas Ditto, but later in the month.

Oats March, and early in April.

Barley April, and early in May.

The corn harvest differs widely in the different parts of the county.

In the Vales, and all Southern aspects, the corn is ripe early in August, if the weather proves tolerably dry—and towards the middle of August, the harvest in these situations becomes general.

In the mountainous parts of the county, the corn harvest is commonly a fortnight or three weeks later.

The hay harvest is as various as that of corn.

In the Vales, they begin mowing the latter end of June—in the Upland farms about the middle of July—and among the mountains not till August.

Inclosed Lands.—In a country of so unequal and diversified a surface as Carmarthenshire, it is impossible to speak with tolerable precision of the proportions of inclosed and uninclosed lands. By the conversation I have had with gentlemen residing in all quarters of the county, together

with my own knowledge of it, the result seems to be as follows :

Taking into calculation the great extent of country, from Carmarthen westward to Midrym, Llanboidy, and Llanglwydwm, and from thence by the borders of Pembrokeshire to the sea, along the coast to Loughors, up that river to Llanedy Forest, and back again to Carmarthen, includes a country almost wholly inclosed. Again, calculate the whole extent of the Vale of Towy, from Carmarthen to Kilycum beyond Llandovery, with all the lesser Vales branching out of it, and the inclosed lands stretching up the sides of hills from these Vales; a vast tract of inclosed country from the river Cych, in the North West, along the river Tiwy Eastward, by Newcastle Emlyn, to beyond Lampeter Ponstephen. Add to these extensive tracts the various inclosed districts of less note, in different parts of the Country, and it brings us to this conclusion, that about two thirds of the County is inclosed.

Size of Inclosures.—The inclosures of this district are small in proportion to the farms, and frequently ill-shaped. I do not recollect to have seen any county where the inclosures were so irregularly shaped as in this district. I apprehend this deformity arose from the slow progress of inclosing in former times.—When the major part of the farms were open, small portions of Land were occasionally fenced in for the purposes of tillage, and probably without much regard to the form of the plot: in process of time, these fences grew so thick, as to be found useful for sheltering the live stock, and on that account were preserved—the inclosures of more modern date are regular, and better adapted to the size of the farms; and I apprehend much benefit would result from a more regular arrangement of the old inclosures, by pulling many of them down, and erecting others, so as to divide the land into better proportions. It is no uncommon thing to see fifteen or twenty
little

little crooked awkward fields upon a farm of fifty or sixty acres.

Common Field.—I do not know of any considerable extent of open common field land in the county.

Advantage of inclosing.—No difference of opinion arises as to the utility of inclosing in general throughout this district; and it is generally believed that population is considerably increased thereby.

The value of the land increases by being inclosed, in proportion to the subsequent treatment it receives; but, upon an average it is thought to be more than double its original value.

Wastes.—Upon the calculation already made of the inclosed lands in the district, it remains for observation, that one-third of it is uninclosed and waste. Many of these extensive Wastes are not common; they are appurtenant to the adjacent estates, but for want of dividing them among the tenantry, no inclosure takes place.—Of 170,666 acres of Waste Lands, about one-half may be deemed capable of cultivation at a reasonable expence, viz. 85,333 acres, and the other half not capable of such cultivation, by reason of its elevation or other difficulties.

Wastes how depastured.—These Wastes are now depastured by the occupiers at large, within the several manors to which they belong, without stint; and are thereby rendered of little value to the community; at least they are not so productive as if some rule was established for regulating the depasturing of them.

Stocks of small sheep are kept upon most of the hills, and a few inferior cattle and horses upon some; but the highest hills do not, as I am informed, keep any stock during the rigorous seasons of winter.

Wastes how improvable.—I presume the best methods by which the Wastes could be improved, may be to divide and inclose them, allotting to lords of manors, and persons having

having common rights, according to their respective interests; and making compensation to the tenantry, in proportion to the loss they may be found to sustain by being deprived of the pasturage of the commons.

The turf upon many of these wastes is a kind of public stock, for which the inhabitants of other lordships pay the lord of the manor an acknowledgment for the privilege of digging, and thereby supply themselves with fuel at an easy expence; it may therefore be proper to let all such turf bogs remain uninclosed, and subject to such regulations as may be devised for their future management.

After being inclosed, these wastes may be let to the occupiers of adjacent farms, in proportion to their extent, and the powers of the tenants. Those who have no adjoining lands, will probably find their account in erecting suitable buildings, and letting their allotments in separate holdings, taking care to bind the tenants to improve, by proper manuring and a judicious succession of crops, previous to sowing grass seeds.

Planting Forest Trees in many parts of the wastes, may be practised with good effect. In situations sheltered from the west winds, and where loose rocks and large stones render the land unfit for cultivation, oak, ash, beech, sycamore, and all the fir tribe, grow very well. In some of these situations the land is moist, and particularly adapted to the growth of elm, alder, asp, and willow.

The opinions of proprietors of estates in this county seem to be unanimous, that nothing acts so strongly in preventing the improvement of waste lands, as the great expence which generally attends the present mode of obtaining authority to divide and inclose them, by applying for an act of parliament upon every occasion of that sort. People of small fortune dread the expence of these applications so much, that they will rather permit their interests in waste lands to lie dormant, than subject themselves to the greater incon-

inconvenience of an expence they are not always able to bear.

To remove this difficulty would perhaps be one of the most popular and beneficial undertakings, in which the Honourable Board of Agriculture could engage. Some of the most intelligent persons I have talked with on this subject are of opinion, that an act should be passed to empower the Custos of each county, with the magistrates assembled at the Michaelmas Quarter Sessions, to appoint commissioners to divide and inclose any waste, upon the application of the majority of proprietors in value, under their hands and seals. Such commissioners to be persons no wise interested in the Waste proposed to be inclosed; and having been previously chosen by a majority of votes, at a public meeting of the proprietors held within the manor or parish in which the waste lies, by notice given on the church door of such parish, for three successive sundays, (during divine service) next previous to the day of meeting,

Such powers as may be found necessary to invest commissioners with; and proper instructions and regulations, as to the making the allotments and paying the expences, may be enacted, so as to answer (it is presumed) all the purposes at present to be obtained by separate acts. It is generally believed in this country, that such an act of parliament would be the means of inclosing every acre of waste land in South Wales (capable of cultivation) in a very few years.

The commissioners may also be empowered to make such regulations for depasturing so much of the waste lands as may be deemed unfit for cultivation, as they think needful; and likewise to direct the manner of protecting plantations of forest trees, and the cutting of peat for fuel. The greatest proprietor of waste lands in the county, is Mr. Vaughan, of Golden Grove; whose lordships are of extraordinary extent, and many of them exercise regal rights at this day; being part of the ancient Duchy of Lancaster.

I regret

I regret not being enabled to give a more particular description of these lordships.

Bishops and Clerical Bodies.—If the act went to empower bishops and clerical bodies, to exchange and inclose their land lying in open common fields, or otherwise intermixed with other properties, the church revenues would be increased in numberless instances, and the property preserved from many encroachments and curtailments to which it is now frequently liable.

Price of Labour.—Labourers are paid ten-pence a day, furnishing their own diet, in summer, and eight-pence in the winter months; throughout the Vale of Towy and the Southern parts of the county.

Towards the Northern and Western parts, and among the mountains, the price is two-pence a day less. Some people diet their labourers, and others keep a cow for them, or a few sheep, and then the wages are in proportion to these advantages.

In mowing and harvest time, the men are allowed diet and beer in some places, and beer only in others; and the mowing is frequently done by the acre, from a shilling to eighteen pence, with beer.

Women do a good deal of harvest work, and are paid in general about two-pence a day less than the men.

Hours of Labour.—The hours of labour are generally from six to six, with half an hour at breakfast and an hour at dinner.

In harvest time, they work from six in the morning till sun-set; or so as to reach the house and eat their suppers before it grows quite dark.

In winter the labourers come to their work at sun-rising, and continue as long as they can see, having eaten their breakfast before they come to work; and taking a reasonable time to dinner.

Wages.—The wages of hired servants are various; in the
Vales

Vales and Southern parts the following may be taken as the general rate of wages by the year :

First Ploughman	5l. 10s.	to	6l. 6s.
Second Ditto	4l. 0s.	to	4l. 10s.
Boy	1l. 10s.	to	2l. 0s.
Dairy-Maid	4l. 4s.	to	5l. 5s.
Under Maid	2l. 0s.	to	2l. 5s.

The northern and western parts,

First Ploughman	5l. 0s.	to	5l. 10s.
Second Ditto	3l. 0s.	to	4l. 0s.
Boy	1l. 0s.	to	1l. 10s.
Dairy-Maid	3l. 0s.	to	4l. 4s.
Under Maid	2l. 0s.	to	2l. 5s.

Drains.—The gentlemen, and those among the farmers who are in good circumstances, begin to be attentive to the art of draining; for the practice of which this county affords an ample field. It is observable, however, that this useful branch of agricultural improvement, is but indifferently understood in the district.

It frequently occurs to one's observation, that much unnecessary expence is occasioned by a superabundance of drains. Nothing is more common than to see drains cut in all directions through a Bog; and it is matter of surprize, that the inefficiency and absurdity of such a practice, should escape the notice of any one, who professes to consider the causes of these ordinary operations of nature.

The first thing to be observed in laying out a piece of land for draining is, the cause of its being wet, whether it is owing to springs issuing from the higher ground, or to a general moist and oozy bottom; the attentive observation of an experienced drainer will decide this important point with great accuracy.

If springs occasion the land to be boggy, the drain should be cut through the eye of each spring, or rather on the higher side of that part of the land, where

the effect of the water is visible; the depth of this drain must depend, upon the depth at which the spring or pipe of water lies in the earth; in general about three feet or three and a half will reach it; and your drain may be sunk about four or six inches below the the pipe, in order to get the complete command of the water, and prevent its communication with the lower lands—the width of the drain may be proportioned to the flow of water—about two feet wide at the top. and nine inches in the bottom, is commonly found equal to the purpose of draining a spring bog of several acres.

Stone Drains.—The best material for filling this drain is field stones, which should be laid in the bottom, by hand, so as to form an open sough, or gutter, to convey the water off; throwing the stones in promiscuously, seems a bad method, as it will often happen, that a stone or two may fall into the bottom of the drain in such a position, as to stop the progress of the water, and then your drain becomes full, and the bog continues as if nothing had been done to reclaim it. After forming a sough, by laying small stones at the sides, and large ones over them, the drain should be filled promiscuously to the lower edge of the surface soil, either with stones, furze, or aquatic brushwood—then a covering of straw or rushes will be necessary to prevent the soil from falling among the stones, which would be very apt to choak the drain, and after that the soil may be thrown in: care must be taken in laying this drain, so that it may not have too much or too little fall; an easy current is the safest, because a rapid stream is apt to break up the bottom of the drain, and the gravel being carried along with the water, may form a lodgement in some part of the sough, and choak it; on the other hand, too sluggish a current admits of the growth of a green slime in the sough, which is often injurious.

Brush-Wood Drains.—Land once drained in this manner is drained for ever; but where stones cannot be got, the
drain

rain may be filled with willow, alder, asp, or beech boughs, which are exceedingly durable if put into the drain green, or before the sap is dried; but if they are suffered to become dry, and then laid under ground, a rapid decay is the consequence.

I have seen willow taken out of a bog after lying there thirty years, and its bark was as fresh and sappy as if it had been recently cut from the hedge; and it is well known, that beech laid green in the water, will continue sound for any length of time.

There is more art required in working a wood fough, than most people are aware of. Laying the wood along the drain, is not the thing, even if it be made into faggots so as to lye at some distance from the bottom of the drain, it is not to be depended upon; for if any part of the side of the drain slips, the faggot, losing its support, sinks to the bottom; and the drain shortly becomes useless.

The completest method I have yet known, is to cut the strongest willows, or other aquatic brushwood, into lengths of about twenty inches, and place them alternately in the drain, with one end against one side of the bottom, and the other leaning against the opposite side.

By clasping your hands together, and extending the fingers between each other, my meaning will, perhaps, be clearly understood.

Having placed the strong wood in this manner, I fill the space left between them on the upper side (as between the palms of the hands when clasped) with the small brushwood; upon which a few rushes or straw being laid, as before mentioned the work is done.

Lands rendered boggy by a general moisture in the understratum, may be treated in a different manner.

Fence Draining.—Where inclosing as well as draining is required, drains made with an easy fall across the land, and the outcast thrown on the lower side, and faced next the drain, with two or three courses of sod, make a neat and effectual fence.

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These

These drains should always be cut so deep as to reach the water stratum, which is a gravelly substance generally found under the clay. About four feet wide at top, three feet deep, and nine inches wide at the bottom, makes a good drain fence. The top of the fence may be planted with quick, or sown with furze, which if kept down by cutting it every two or three years, makes an excellent fence.

In lands of this sort, where fencing is not required, the drains may be made and filled in the same manner as that recommended for draining springs: but care should be taken in either case, to sink down to the water stratum *.

I have observed upon several gentlemens demesnes in this county, that the benefits of draining have been lost, for want of attending to the water stratum; without which the money spent in labour, might as well have remained in the owner's pocket; getting through the soil into the clay, and drawing off a little surface water, is but a feeble effort at draining; and yet this has been done by some, who give themselves credit for wonderful sagacity in this branch of rural economy.

Embankments.—The fens of this district lye near the coast about Kidwelly and Llangennech, and are of considerable extent; they are, for the most part, overflowed by spring tides; and on that account called salt marshes. Laugharne marsh, lying on the west side of Tawe river, has already been mentioned, as a valuable tract of excellent land. Why no attempt has been made to embank and drain the other marshes, which consist of a soil equally valuable, is matter of much surprize; especially as most of those marshes may be embanked at a very moderate expence, since the tide does not rise to any considerable heighth over them.

* If lands of this sort lie very flat; it is better to make open drains, sloped to the width of six or eight feet on each side, to prevent their falling together; and also to admit the passage of Beasts, &c.

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I was informed, by an intelligent person who lives in that part of the country, that a bank six feet high, would be fully adequate, to resist any tides, by which those marshes are overflowed; upon this statement, I have calculated the expence of embanking the Carmarthenshire marshes, at about two shillings and eight pence per yard long; from which any proprietor may easily calculate the expence of an embankment; adding about twenty per cent. for skillful assistance in setting out and superintending the work.

Should any embankments take place, I beg leave to recommend one essential thing in the construction of them; that is, to make the sod facing on each slope of the bank, at a pitch of forty-five degrees.

Many embankments have been made more steep, but they are liable to be broken down by the action of the water against them. An embankment made upon the principle here recommended, will best resist the water; which in that case, acts with equal pressure horizontally and perpendicularly; and in stormy weather, upon high tides, the waves will not have so much power upon a slope of this sort, as against a bank of nearly an erect side.

Sluices.—In making the sluices, care should be taken to set the sills so low, as to give a quick outfall from the main gout or drain, through the sluice gate; in order that no weeds nor obstructions may lodge between the gate and the sill, and thereby admit so much water as to become dangerous to the lands within—the drains should be of such a depth, as that the water may always lie two and a half or three feet below the surface of the land; otherwise it will be liable to produce rushes and sedges.

Fenns.—In a country where labour is cheap, it is much to be lamented that such valuable tracts of land as these marshes may be made, should be left in so unproductive a state as they now are.

There is a considerable tract of fenn land between Carmarthen and St. Clears, capable of being drained at a reasonable

sonable expence; and smaller tracts of similar land are to be met with in various parts of the county.

Woods.—The prodigious havock that has been made of late years among the woods of Carmarthenshire is truly alarming.

From being a well wooded country, it is now become the reverse; and the stock of timber is diminishing so rapidly, that a very few years will probably reduce the inhabitants to great straits for a supply of this necessary article.

The vast quantities of timber, which every part of the county produced till of late years, seems to have begot in the proprietors an indifference as to the protection of their woods, from which too many of them have not yet recovered.

But surely the approaching scarcity is a circumstance sufficiently important to awaken the most torpid to a proper sense of their future interests; and it is most sincerely to be wished, that every proprietor of woodlands in this county, would follow the few examples to be met with at present, of fencing their coppices, and promoting their future growth by every possible means.

The inequalities of the surface of this district, render it in a peculiar manner adapted to the growth of timber.

Forest trees of all sorts thrive well here, particularly on the slopes of hills sheltered from the south west wind, and in the vales; of which the extensive and valuable woods about the seats of Lord Dynevor, Mr. Vaughan, of Golden Grove, and several other gentlemen, afford undeniable proof.

In a country thus favorable to the growth of so ornamental, so useful, and so necessary an article, is it not to be regretted that its cultivation should be neglected? and every one interested in the future prosperity of this valuable county, must perceive the advantages of using all possible endeavours to keep up the stock of timber.

I do not find that there are any nurseries for raising forest trees for sale, in sufficient quantities to supply a

great demand; perhaps an undertaking of this sort, under the encouragement of the gentlemen of the country, might be productive of the happiest effects, by giving opportunities to proprietors, who wish to improve their estates by planting, to supply themselves with forest plants at an easy expence.

Some seedlings are purchased in boxes from the London and other nurseries; but the high price of the land and labour in those parts, occasions the plants to be so crowded in the nurseries, that when they come to be set out in more exposed situations, they do not often thrive to the satisfaction of the planter.

Peoples Turn for Improvement.—The people of this country in general, for there are many exceptions, are not forward in receiving improvements in agriculture. They all acknowledge the advantage of improving the soil, and yet very few practise it. When you come to examine their motives for a conduct so opposite to prudence, they tell you, they are afraid to let the land go out of tillage in good heart, lest their landlord should raise their rent at the expiration of the lease; and they are afraid of adopting English fashions into their mode of farming, lest their neighbours should laugh at them.

Such are the apologies commonly made by these people for the worst sort of rural management that can be conceived; and how to excite a spirit of improvement in the class of people here alluded to, seems very difficult.

Certainly, a work so desirable, can only be accomplished by the attention and good conduct of the landlord towards the tenant in the first place; and by a proper regard to his engagements, on the tenants part, in the next.

In hopes some abler hand will point out better methods for promoting the general improvement of the soil of this district, I shall now venture, though with much diffidence, to recommend what strikes me as most likely to introduce amendment.

Supposing a gentleman possessing an extensive property, occupied by a numerous tenantry, was to select one or two

of the most tractable, honest and industrious farmers upon any connected tract of the estate. Suppose upon a farm of a hundred and fifty acres.

The farm being set up with a proper farm yard, a moderate sized barn, a stable, with a granary over it; ox-house, cow-house, wain-house, calves-cott, and piggery; with a shed on the west side to shelter the yard, and for the outlying cattle to run under in severe weather. Hedges, gates and ways of communication in good trim, the farmer begins his operations, and raises the first year, ten acres of turnips; also such corn crops as he finds the farm in plight to receive.

By a proper consumption of his turnip crop and strict attention to the collecting of manure, he will get together a good body of dung and compost for the ensuing year; and may then increase his green crops, so as to establish a regular course of tillage husbandry.

The proprietor of this farm, or his agent, is supposed to be well skilled in the management of green crops, and the successive growth of corn crops; to be active and diligent in instructing this farmer through the whole management of his farm; to see from time to time, that he keeps a regular and just account of his expences and receipts; and that every thing is conducted upon frugal principles. Without this attention, no good can be expected to result from the trial. At the end of a few years, it will appear whether the farmer has benefitted or lost by this mode of culture; and his neighbours will have had a fair opportunity of seeing the whole business carried on by a man of their own rank, whose reports they may receive with confidence. If they find the new method has turned out more profitable than their own, taking into consideration, the improved state of the soil, there may be good hopes the system will be adopted by all of them. The tillage course established upon this farm is intended as a preparation for laying down the major part of the lands in pastures, as fast as they become fit for that purpose.

Something

Something like this, would convince people of the utility or loss of the green crop system ; and the farmers would be satisfied with the report their neighbour gave of the result of his trial. Gentlemen of fortune, trying experiments upon their own demesnes, do not afford that satisfactory kind of example to a neighbourhood in general, which is necessary to instruct their tenants. Remarks are always made with reference to the landlords powers. A neighbouring farmer says " I could farm like my landlord, if I had his purse."

In constructing farm buildings, the strictest regard should be paid to œconomy ; the buildings should be just large enough to answer the purpose and no more—erected upon the cheapest plan possible :—built firmly, and well secured against the effects of storms ; so as to prevent, as much as may be, the expence of future repairs. An ostentatious display of buildings, disheartens a farmer who is to engage in a considerable share of the future expence of keeping them up ; and such ought never to be built upon farms intended to be let.

Situation of Farm Houses.—The situation of farm houses in this district is frequently very bad. They are, in many instances, built in low bottoms ; and in others, at the extremity of the land. Each of these inconveniencies should be studiously avoided in all future erections of this sort ; and also another inconvenience, which has of late years crept into this country ; namely, that of erecting farm houses upon situations too elevated and exposed.

Three things should direct the choice of a situation for a farm yard ; water, shelter and centricity. Wherever this combination of conveniencies can be found, is the proper situation to build upon—avoid, if possible, a western exposure ; which in this district is the most distressing wind we have to guard against. In a farm yard lying to the south east ; and sheltered by the buildings from the west and north, the cattle always thrive best. It generally happens, that a stream of

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water

water may be brought to the situation on which you wish to erect your farm yard ; a good pond should always be made at the lower side of the yard, to reserve a stock of water for watering the meadows below ; the profits, resulting from such a conveniency, are too obvious to need further remarks.

It is observable in this country, that breeding cattle and dairying, are the best adapted to the nature of the soil and climate. The soil is naturally disposed to produce grass ; and the dampness of the air, is peculiarly favourable to vegetation ; a combination of advantages in grazing, which points out this county as highly favourable to the production of stock and the fruits of the pail. Corn is not a certain produce here, nor are there at all times sufficient demands for it in such quantities, as to induce husbandmen to make it their principal object.

A judicious mixture of dairy, breeding and tillage, seems well adapted to the climate, the soil and the temper of the inhabitants.

Having already remarked, that the agricultural practice of gentlemen of fortune, does not appear to have any considerable influence upon their inferior neighbours, I might mention many instances of very excellent farm management, among the gentlemen of different parts of the county, in support of this opinion.

Among the best examples of a regular system of husbandry, established upon an extensive scale, is that of Talliaris Demesne, which is now in a progressive state of improvement, under the personal direction of the proprietor ; whose knowledge of, and attention to, the various branches of the farm, are producing the most desirable effects ; in bringing a soil, to which nature has not been very bountiful, and art still less so, to a very high degree of cultivation, under as judicious and well conducted a course of modern agriculture, as has at any time fallen within my observation.

Lands, which heretofore were of very inferior quality, but now producing the finest crops of cabbage and turnip, with successions

successions of corn and grasses, by means of methods which every farmer may adopt if he will; hold out sufficient examples for the imitation of a country; but so it is, that in this, as well as some other counties of Wales, no example, however feasible and obvious, is found to excite a spirit of imitation among the peasantry; otherwise, the specimen just mentioned would ere now have produced the happiest effects, in the neighbourhood of Lord Robert Seymour Conway.

Stock.—The horned cattle claim the first consideration in this district, as they are the most important to the farmer.

Horned Cattle.—The original black breed of the country, is the most prevalent; and is a short bodied coarse kind of beast; on the mountains, these cattle are very small; and in the vales and better lands, they get up to larger sizes; but are almost every where ill shaped, and unprofitable to the pail. Many are the kinds of horned cattle, which the gentlemen of this county, (with a very laudable zeal) have introduced in order to amend the breed; and yet it does not appear, that any kind has taken the lead in a decided degree. The long horned Leicestershire, the Herefordshire, Shropshire, Glamorganshire, and Pembrokeshire, have all had their day with particular gentlemen; and each kind seems to have been the favourite at different periods. The best opinions on the subject, seem to concur in declaring, that no good cross has yet taken place in the county to any considerable extent, and that all the original breeds hitherto introduced, are improper to stock the district.

Further trials may probably fix this matter upon a proper basis; and whether the cross between the Pembrokeshire heifer and Herefordshire bull will prevail or not, must be left to future experience*.

* An intelligent gentleman of Carmarthenshire, lately told me this cross is the favourite in Herefordshire at this time; and is called (in the modern phrase of breeders) the crack breed of that country.

It is a very general opinion in Carmarthenshire, that something ought to be done towards improving their cattle in shape, size, and milk.

Sheep.—The sheep upon the mountains of this district, are the native stock of the country; and weigh from nine to eleven pounds a quarter when fat. The wool from a pound and a half to two pounds per sheep.

It is apprehended no cross could be introduced, for increasing the size or wool of these sheep, as the lands on which they live would not support a larger breed.

In the vales and upon inclosed upland farms, crosses from larger breeds are introduced and succeed very well. The Ryeland Herefordshire breed, the Dorset, and the Gloucestershire Woad kinds, are found to answer. Upon the whole, I conceive the latter kind are best adapted to the generality of farms in this county.

A wether of about sixteen pounds a quarter, that will cut four pounds of wool, is best calculated for these markets; and is perhaps, the most profitable sized sheep that can be propagated here.

Rot in Sheep.—The rot in sheep is not common in this district. The farmers bordering upon the marshes about Kidwelly and other parts, are cautious to keep their sheep from the marshes in dewy mornings; at which times, they say, the sheep are apt to get the rot more than in dry weather. I have not been able to procure any information, as to the species of grasses these Lands produce; and it may be well worth the attention of the neighbouring land owners, to cut some sods from the marshes, and remove them to some moist situation to produce their seed stems, by which the kinds may be accurately ascertained. Probably the morning exhalations of the marshes may be more injurious, than the grasses they produce.

Horses.—The breed of horses is not much attended to by farmers; the general smallness of the farms, seems to operate against

against rearing colts, by confining the farmer to such narrow limits, that he has no run for idle stock; his cows and working oxen occupy all the land he can spare to lye under grass; and whilst the present destructive method prevails, of exhausting the soil, and letting it remain a series of years to recover, we may not hope to see any considerable improvements made in the breed of horses. In general, the few colts reared in this district, are starved and checked in their growth, for want of proper keep. Many gentlemen and a few farmers, are getting into better breeds of horses, both for the saddle and draught. Particularly in the vale of 'Towy', where you see good teams upon many farms, and a better kind of saddle horse than were observable some years past. Blood stallions are brought every season from the English counties; and draught stallions from Herefordshire and other countries; but breeding from good horses, is not yet become general.

Swine.—The farmers appear not sufficiently attentive to the breed of swine—a narrow, short, prick-eared kind, is observable in most parts of the county. Several gentlemen have better sorts; and a cross of the Berkshire breed may be seen in some places.

A few pigs are always profitable upon a farm; and those sorts that will thrive most in a given time, are clearly the best; it therefore behoves every one concerned in this species of stock, to attend to the improvement of the breed.

Butter.—Salt butter may be mentioned, as an article of great importance to this district; there seems to be some regulations necessary to check the fraudulent practices that have prevailed in the package of salt butter, in this as well as other counties of South Wales; by which its character is much impaired at the principal ports of the kingdom to which it is sent.

I presume, if inspectors were appointed at every sea port where butter is shipped, to examine its quality, and mark each firkin according to the class to which it belonged. viz. First,
second,

second, and third; a spirit of emulation would arise among the dairy women; and every one would strive to produce butter of the best quality. The worst sort may be marked as grease and put at a price accordingly; by which means the dirty slut, who packs bad and rancid butter, would find her tricks frustrated; and the honest, cleanly dairy woman would be rewarded for her care and neatness.

The farmers name and place of abode may be marked upon each firkin. The inspector to be paid a reasonable sum per firkin, for his trouble of boring, examining and marking the quality of the butter; and a penalty inflicted upon him for neglect or fraud, in the discharge of his duty.

Such other matters as might be thought necessary, would occur in the course of framing an Act of Parliament, for this salutary and necessary purpose; in which, great helps may be drawn from a perusal of the laws now in force, for regulating the package of salt butter in Ireland.

Corn by Weight.—The indiscriminate manner in which our corn dealers buy oats and other corn for exportation, is an obstacle to the growth of good grain; it is a common practice with many of them, to give one general price for the respective grains, without proper regard to the quality. If grain was sold by weight, instead of by measure, the improving farmer, who takes care to sow good seed in well prepared soil, would receive a just compensation for his pains, and the bad one, who attends to neither of those important points, may be stimulated to amend his practice.

The great variety of soils in Carmarthenshire, and the manner in which they are interspersed, renders it a difficult task to point out the particular sort of improvement, to which each is adapted. The only extensive tract of regular soil, is in the celebrated Vale of Towy; and even there, the quality varies considerably.

Every occupier before he begins to improve a piece of land, will consider the quality of its soil, and for what purpose
it

it seems fittest. There is one line of conduct, which seems so decidedly applicable to the Vale lands, that I presume no difference of opinion can exist upon so obvious a matter; namely, that of laying down the lands for grass, and occupying the whole in dairy and breeding.

Vale of Towy.—It is mortifying to see the fine lands of the Vale of Towy and other fertile tracts of this district, driven by the plough to the most deplorable state of sterility; more than half the Vale seems reduced to this condition; and much of its surface may be seen in the extreme of poverty, whilst adjoining lands of precisely the same quality, are cloathed with a pleasing and profitable verdure.

Instances of better management may be seen among the gentlemen—the fine pastures and meadows about Lord Dynevor's residence at Dynevor Castle; and the extensive tracts of rich land belonging to the demesne of Mr. Vaughan, of Golden Grove; with those of many other gentlemen of the Vale of Towy and other parts of the district, are sufficient proofs of the capability of improvement this county possesses.

Dairy.—Partial improvements are to be seen in most quarters of the county, among people who have the good sense to know the advantages of keeping their lands in good heart. Of dairy farmers, there are but few who confine themselves to that profitable branch of rural management; as one instance of the establishment of a dairy farm, properly so called, I can venture from my own observation, to point out, as highly worthy of imitation, the practice of Mr. Philipps, of Court Henry; this gentleman's attentive and skilful management has, in the course of a few years, brought his lands and stock to a degree of improvement fast approaching to perfection; and as a proof that the prejudices of the ordinary farmers in the Vale, are gradually giving way to the conviction of reason, several of them (with a degree of candour, I could hardly have expected) readily acknowledge Mr. Philipps's management is better than theirs.

I have

I have conversed with many of these people at different times, and asked them why they do not pursue a mode of farming so obviously advantageous and applicable to their soil. The expence and risk of a corn crop, where such quantities of rain prevail, and where much of the land is liable to floods; are obstacles to tillage husbandry, which they all admit; but the evil they complain of, is want of capital to pay their rents, during the first two or three years after laying down their lands in grass, and until it recovers its sward and becomes productive. The fact is, the people have impoverished the soil, and the soil in its turn has impoverished them, and amply revenged the wrongs it suffered by the farmers; put a sloven upon ever so rich a soil, in ever so good condition; let him impoverish his farm, and I'll answer for it, the farm will pay him back in his own coin, and impoverish him, unless he runs away from it.

Vale Lands.—Since the ready penny appears to be the principal motive with the generality of Vale-farmers, for continuing a practice they know to be wrong; may it not be well worth the consideration of proprietors of such lands, to adopt some plan for obviating the difficulty. Suppose a gentleman of extensive landed property, was to let a farm upon a new lease, and remit for the first three years, the rent of so much of the land as appears to have been driven by the plough, and consequently not in a state to become immediately profitable under grass; at the end of that period, an increase of rent might commence, rising yearly in due proportions, until the whole farm becomes fully improved; and then to continue at the rent agreed upon, for the remainder of the term. By something of this sort, the difficulty of procuring a ready penny to answer the landlords demands would be done away; and the farmer would feel himself gradually rising into wealth and comfort.

I have thus dwelt upon the subject of the Vale lands, because I think them of infinite consequence to the agricul-

ture of the county at large. Difficulties may be seen and objections started; but I humbly presume, steady perseverance may remove them all—the landlord would be sure to receive in the end, what he sacrificed at the commencement of a lease; and the tenant would no longer be struggling with difficulties, which by the present impoverishing practice, are daily accumulating upon him.

All the strong loams of this county produce good grass, when laid down in proper condition. The method of doing this is too obvious to require any particular detail; every Carmarthenshire farmer knows, that if he manures and ploughs his land well, and afterwards forbears to run it out of condition by too many corn crops, it will become good grass land.

In dry loamy soils, artificial grasses may be sown with success on lands intended to be laid down for pasture or meadow; but I doubt whether the natural grasses of the Vales may not be preferable to any other sorts. Cow grass, Dutch clover, and the fine rye grass or darnel, seem to be a desirable mixture for producing an early sward.

Where this soil is found to be shallow; it produces excellent crops of barley and oats, with profitable returns of artificial grasses; and by keeping it in a proper course of tillage, with intervening green crops, it answers very well; whilst the other parts of the farm are kept in grass for the dairy and rearing business*.

In many parts of the county, a strong loam is found upon a clay moist bottom; most of these lands have an easy slope,

* The culture of rape for spring fodder, is perhaps the best sort of green crop for the generality of farms in this county; and I have great confidence, that if it was once introduced and its benefits known, the practice would become general. Rape may be managed to great advantage with very little expence, and it thrives vastly well in this moist climate without much care or labour. A piece of rough land pared and burnt, manured with a moderate quantity of lime, and sown with rape, affords an excellent crop. Barley succeeds well after it—then clover—then oats; or with a slight dressing of muck, or compost of lime and bog earth, barley may be sown without a doubt of success.

so as to render the draining of them cheap and profitable. An useful kind of fence drain may be made upon such lands, at a small expence. Let a morassy piece of ground, lying with an easy or quick descent, be inclosed by making an open trench at the upper side, between the wet and the dry land. Let this be six feet wide at the top, three feet or three and a half deep, and eighteen inches wide at bottom, neatly sloped at the sides; a sod facing on the lower side of the trench, three feet high, and all the outcast of the drain thrown behind the sods; this gives a complete fence, which may be planted with willow or alder, or sown on the top with furze, according to the situation and the will of the owner; care must be taken, so to conduct the fence drain, as to give it a fall to each or one side of the inclosure. The side fences will also be made in the same manner, and one or two cross drains of the same sort, may be made to divide the field (if necessary) into smaller classes.

Lands thus drained, generally require paring and burning the first year; in order to destroy the coarse surface, which is exceedingly laborious to pulverize by the plough and harrow.

The labour after paring and burning is easy; and the ashes produced thereby, with about six common cart loads of lime to each acre, make an excellent preparation for a crop of wheat, cole seed or turnips; after which the only error to be avoided, is that of taking too many successive corn crops, before the land is laid down in grass.

The peaty soils upon moist bottoms may be treated in the same manner; and in general, it will be found advantageous to ridge the land up in ridges of twenty or twenty-four feet wide; always ploughing to the back of the ridge, by which means the rean becomes a drain to each ridge; but this must not be done with the first crop, if you sow wheat, as it will require to be laid in small ridges to stand the winter, in order to keep the roots of the corn dry; in all succeeding crops, the large ridge may take place.

Having spoken of the common plough of the district as a very bad one, it may be expected I should recommend a better.

Some

Some of the best ploughs I have seen in Wales, are in use about Machynlleth; and were brought there from that of Shropshire, which adjoins Montgomeryshire as before mentioned; the share is sharp-pointed and winged, the earth board curved and plated with wrought iron; it has two handles, which gives complete power to the holder—the whole plough is compact, light and firm—it turns as neat a furrow as can be imagined and is calculated for all sorts of ground (hilly as well as level) better than any other plough I have yet seen in Wales. In all free soils tolerably level, the light Suffolk plough with one handle dispatches a great deal of business very neatly, and saves the expence of a driver, as it is drawn by two horses a-breast. The common objection to English ploughs in this county is, that they do not work well among stones; it is true that a man used to a particular sort of plough, may find it suit his hand better among stones, than a plough he is a stranger to; but in fact, there ought not to be any large stones in the arable lands of this country; and if they were picked every time the land is stirred, either by plough or harrow; the objection to good ploughs and the difficulty of good ploughing would soon be removed.

Field Stones.—The surveyors of turnpike roads and the parochial surveyors of highways, would essentially serve the country, by repairing the roads more generally with field stones; and the expence of gathering them, if done by women and children at so much a load, would frequently be less than digging a bad sort of material called rabb, in the neighbouring quarries. A load of field stones is better than two of rabb for service.

Good Tenants encouraged.—Nothing promotes improvement in a country more, than giving proper encouragement to improving tenants who keep their farms in neat order and their soil in good condition; wherever a landlord perceives such progress upon any of his farms, I humbly presume he cannot promote his own interests better, than by holding out

all reasonable assistance to the industry of the farmer. When his lease expires, it is an act of equal justice and policy to give such a tenant a substantial proof of the preference he holds in his landlord's esteem; if larger offers are made for the farm than it may be fairly deemed worth, they ought not to be listened to; it is dangerous to let a tenant, whose good management you are not confident of, come upon a farm that has been put into good condition; the man who has improved it, is more likely to set a proper value upon his former labours, and to keep the lands up to what he has brought them to; indeed, it is notorious, that the estates of gentlemen who treat their tenantry with moderation and candour, are much more productive, than those of other proprietors whose conduct is harsh and severe.

Collieries.—The collieries in this county are rich and extensive. Several years ago, a spirited undertaking was completed by the late Thomas Kymer, Esq. who possessed an extensive coal estate, lying upwards of three miles from the sea port of Kidwelly; which, owing to the distance from the port and the bad state of the roads, was of little or no value.

Kidwelly Canal.—Mr. Kymer obtained an Act of Parliament, for making a canal, with proper railways and wharfs, for conveying the produce of these collieries to the shipping; and superintended the execution of the whole plan, which was completed in a stile that reflects the highest credit on the enterprising spirit and steady perseverance of the proprietor. It is much to be lamented, that this gentleman did not live long to enjoy the fruits of his commendable exertions, which I understand have turned out very beneficial to his surviving sisters, the Miss Kymers, of Kidwelly.

An extensive canal is now projecting, under the patronage of many gentlemen of high respectability in this county; to commence at the Port of Loughor, and cross the country through or near the collieries, mines, and lime works of Llandebyê, to the Vale of Towy near Llandilo; and up that
Vale.

Vale to the neighbourhood of Mr. Campbell's extensive and rich lead mines. This canal promises great advantages to the adventurers, and will be productive of infinite good to the neighbourhood at large; by conveying fuel and manure to those parts that now stand in need of them; and affording a ready outlet to the mines, coals, and other productions of the country.

Paring and Burning.—In the hilly parts of the county paring and burning is a very common practice, not with any view to the improvement of the soil; but the contrary. The common method of bringing a piece of rough land into tillage, is to pare the surface by a broad mattock or hoe. When the sods are sufficiently dried, they are thrown in heaps and burnt; the ashes are spread upon the surface of the land, with sometimes the addition of lime. The tillage process then commences in all its terrors—the soil obtains no quarter from the unrelenting ploughman, who pursues a succession of corn crops, until the land is totally exhausted, and then he takes his leave of it; permitting it to rest for a series of years, until it is thought so far recovered from the effects of his industry, as to engage him in some further exertions of a similar kind.

Provisions.—The price of provisions fluctuates considerably in this district—from the middle of July to Christmas, grass beef and mountain mutton become plentiful, and are generally bought for about three pence a pound. Veal is sometimes cheaper; I mean such of it as is fit to be called meat, for there is no inconsiderable quantity brought to market, the description of which would be disgusting. Pork may be classed in the price of beef and mutton.

After Christmas, the markets rise; and butchers meat becomes about four pence or four pence halfpenny per pound, and continues so until mountain mutton and grass beef come in and the price falls.

Fresh butter is in Summer eight-pence a pound—in Winter nine-pence or ten pence. Wheat is often very dear.

in this county—the quantity grown is not equal to the consumption.

Of Barley and oats they raise a superabundance, the prices now are

Wheat . . .	5s. 0d.	to	5s. 6d.	Winchester bushel.
Barley . . .	2s. 10d.	to	3s. 3d.	
Oats	1s. 10d.	to	2s. 3d.	

The wheaten flour consumed in this district, was for the most part imported from Bristol—the obvious disadvantage of this traffic induced a gentleman of Carmarthen to erect a mill for the purpose of making sack flour; an undertaking which promises infinite advantage to a great extent of country, by encouraging the farmers to grow wheat in greater quantities, and holding out to them a steady market for it; the neighbouring inhabitants will be great gainers, in as much as they may now be supplied with flour at a cheaper rate than heretofore. The poor also will be benefitted by the establishment of this mill, which supplies them with household bread flour at a lower rate than they can procure it through any other channel; and as a mill has not been erected with any view to monopoly, and is conducted upon the fairest principles, it is justly entitled to the warm support of every well wisher to this country. The proprietor of this beneficial structure, is Mr. Herbert Lloyd.

Roads.—Carmarthenshire is more interested by turnpike roads, than any part of South Wales I have traversed. In travelling through this country, one feels much regret that many of the roads made some years ago, are ill contrived; by being laid out, in numerous instances, very injudiciously; and not by any means in such convenient lines as the situation of the country was capable of; the early made roads have been found to be too narrow, insomuch that they could not be kept in repair, by reason of the carriages being constrained by the limited width of the road, to travel in one and the same track; which has occasioned the roads thus circumstanced to
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be worn out so rapidly as to baffle all endeavours to keep them in proper repair.

The great inconvenience of this mismanagement has long been felt, and is now remedying; by widening the road between Carmarthen and Saint Clears, and some others in the county.

The salutary effects of this improvement are so obvious, that it is hoped the Trustees of all the old roads will adopt it.

The turnpike roads of modern date are better contrived, and in general of a proper width and well formed, which is chiefly to be ascribed, to the knowledge the gentlemen of the county have acquired, by experience in road making; and to the assistance of persons possessed of practical skill in such works.

The good effects of turnpike roads, it is hoped will induce gentlemen in every part of the district, to exert themselves towards amending and widening the bye roads, which will be the means of bringing improved carts and other carriages into general use.

Farm Houses and Offices.—The state of farm houses and farm offices in this district, is for the most part very defective. Many of the farms that have been taken into the landlords hands for the purpose of improvement, are well established with buildings and other conveniences; but by far the greater number are in very sad condition in this respect, and it would be difficult for an English farmer to conceive the shifts and contrivances made use of, as substitutes for proper accommodations.

Farm Building.—The present method of binding tenants by their leases, to keep the buildings in repair at their own cost, and to find all materials for the purpose, does not appear quite so advantageous to landlords, as may be thought on a superficial view of the measure. . At least, this kind of agreement between landlord and tenant, may probably be one of the principal causes of the inferiority of most of our farm structures; and I am of opinion it will appear upon mature consideration

consideration to be ultimately injurious to the interests of the land owners of this district.

The covenant, by which the whole repairs are thrown upon the tenants, occasions our farm buildings to be very generally neglected; no country exhibits more wretched conveniencies for farm uses, than are generally to be seen in this district. Very few convenient farm yards are to be met with, and the dung heap is commonly left to chance, more than to any methodical course of management. It is no uncommon thing, to see the straw from the barn door, thrown promiscuously into a lane or highway passing by the farm buildings, where it is left to chance, and its soak water frequently runs away, without any attention to the improvement it would produce upon grass land. The out door stock of cattle, &c. are permitted to ramble at large during Winter, over the whole farm; by which all the advantages of making dung by a well regulated straw yard are lost. When the season for manuring his land arrives, the farmer scrapes every handful of scattered dung he can find, but feels himself much straightened in that valuable article, from his inattention to the making of it during the Winter. Many sensible gentlemen of landed property are aware of the inconveniencies arising from this mode of laying all repairs upon the tenant—not one tenant in ten will keep his buildings in proper repair, or erect such new ones as his business requires; if landlords proceed to enforce the performance of such covenants by course of law, the tenants ruin is the consequence; and it happens frequently, that when the lease falls in, the landlord must expend two or three years rent in repairing the premises, or let the estate at an under value, in consequence of a new Tenant taking the repairs upon himself. Some landlords are of opinion, that if the leases were so framed as to engage the tenant to do all workmanship and carriage for repairs, and new erections; and the landlord to provide all unwrought materials, the husbandry of the district would be greatly improved and the landlords interest not

impaired thereby. If, where old leases exist, the tenant was to allow the landlord five per cent. for the monies expended in providing materials for new buildings, I believe much good would result to both, by such measures; the face of the country would soon wear a better countenance; the possession of convenient and comfortable structures, would bring the tenantry to a neatness in the management of their farms, and raise their minds above the make-shift, beggarly habits, which too many of them now practise. It is meant that the landlord should always be consulted as to the extent, situation, and structure of the buildings.

Leases.—The term of the leases commonly granted upon lands in this district, is for three lives, and the life of the survivor.

The lands are always lett at rack-rent, there being no instance that I know of, of leases granted upon fines—except church lands.

The tenant covenants to keep the houses, fences, gates, &c. &c. in repair during the term; and to deliver them so repaired at the end thereof. Also to bear and pay all rates, taxes, assessments, and impositions, as well parliamentary as parochial.

Not to plough, or otherwise break up any meadow land, belonging to the farm, without the landlord's consent in writing; or to pay an additional rent, in case he infringes this covenant.

Not to sell or dispose of any dung, hay, straw, corn in the straw, or compost produced upon the lands; but to expend the same upon the premises, in a proper and husbandlike manner.

Not to cut any trees or underwoods, which the landlord reserves; with mines, minerals, &c.

In some leases, the tenant covenants to manure every acre of land he breaks up with a certain quantity of lime, and a proportional dressing of dung. Not to take more than three

or four successive corn crops at one course of tillage, one whereof to be a green crop; and then to lay the lands down with a mixture of clover and other grasses*.

Harvest Work neatly done.—The harvest work of this district is performed with a neatness and security worth noticing—the barley and oats, as well as the wheat, is all bound into sheaves. If the barley, or oat crop stands tolerably well up, it is mown with a scythe and cradle: but if it happens to be too much lodged for mowing, then it is reaped. In either case the corn is laid neatly upon the stubble, and due care taken to lay the ears all one way. When it has lain a sufficient time to wither, it is bound into small sheaves, and immediately stacked up in stacks of about a cart load each, taking care to set the butts of the sheaves out side and next the ground; the top is hackled, or coped with sheaves, inverted, so that no wet can penetrate. In this state the corn remains in the field, till all the hurry of harvest is over, and the farmer carries it home at his leisure. In a precarious harvest, this method may be found beneficial in any country, a little practice gives the people a very quick method of doing it; and when the weather is changeable, much corn might be secured in this manner, at short intervals, when it might be too late in the day to begin carrying barley and oats from cocks.

Commerce and Manufactures.—The commerce of this county is very trifling; at least its influence on the agriculture of the district cannot be great, as there is no handicraft trade or manufactory established, for the employment of the people in such numbers, as to make a visible impression upon the markets—the great lead mines, which lie some miles north of Llandovery, belonging to Mr. Campbell, of Stackpole Court; a furnace for making iron and the forges, and

* I do not recollect to have observed a regular performance of this covenant in any one instance.

other works dependant upon it, belonging to Mr. Morgan, of Carmarthen; with a few iron forges of less note, give employment to a considerable number of people.

The manufacture of woollen stockings in the neighbourhood of Llandovery was considerable, but is much fallen off latterly; a circumstance to be regretted, as the woollen manufactory seems better adapted than any other, to the inclinations of the people of this district—every woman here knows how to card and spin wool; and if the manufacture of stockings, flannels, and narrow cloths was properly encouraged, it is presumed nothing could contribute more effectually to the comfort of the labouring poor of this county.

Peoples Turn for Improvement.—In the neighbourhoods of Carmarthen and Llandilo, the people seem to be shaking off their old prejudices in a considerable degree; and the general inclination, in almost every part of the county, for the introduction of turnpike roads, presages the approach of amendment in other branches of rural œconomy.

Agriculture Society.—The influence of a very respectable society, established in this county for the encouragement of agriculture, &c. is thought to produce very beneficial effects; but the slow progress which the operations of such an institution, in a country like this, must necessarily have, seems to dishearten many of its members and well-wishers. They apprehend the effects of the Societies premiums are not sufficiently general and conspicuous; and do not take into the account, how exceedingly backward the science of agriculture was when this institution began. In a work so extensive, a very rapid progress towards perfection is not to be expected; nothing but steady perseverance can afford room to hope for success in a plan of this sort; and if land owners of every description, would make a point of joining hand and heart in promoting the views and assisting the operations of this popular institution, the most desirable effects might reasonably be expected to result from their united exertions. If gentlemen

gentlemen would be punctual in attending the meetings, and vigilant in examining the merits of the claimants for premiums; their tenants and neighbours, would look up with proper respect to the Society; and would be impressed with the importance of the institution, in a manner that might be expected to produce that spirit of emulation—which it is ever the object of such establishments to excite.

Obstacles to Improvement.—Among the obstacles to improvement in this county, may be stated the local prejudices of the common farmers, and the present mode of paying tithes in kind. Should the Board of Agriculture be enabled, through its united wisdom and influence, to procure the adoption of some eligible plan for commuting the payment of tithes; I do not know of any one measure, that would be productive of so much good to the country at large, to the industrious farmer in particular, and ultimately, to that venerable body, whose support principally arises from that portion of the products of the earth.

F I N I S.



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GENERAL VIEW
OF THE
AGRICULTURE
OF
NORTH WALES.

GENERAL VIEW
OF THE
AGRICULTURE
OF
NORTH WALES.

WITH
OBSERVATIONS ON THE MEANS OF ITS IMPROVEMENT,

By GEORGE KAY.

DRAWN UP *at Brit*
FOR THE CONSIDERATION OF THE BOARD OF AGRICULTURE
AND INTERNAL IMPROVEMENT.

EDINBURGH:
PRINTED BY JOHN MOIR.

1794-
1794



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TO THE READER.

IT is requested that this paper may be returned to the Board of Agriculture, at its office in London, with any additional remarks and observations which may occur on the perusal, *written on the margin*, as soon as may be convenient.

IT is hardly necessary to add, that this report is, at present, printed and circulated for the purpose merely of procuring farther information respecting the Husbandry of this district, and to enable every one to contribute his mite to the improvement of the country.

THE Board has adopted the same plan, in regard to all the other Counties in the United Kingdom; and will be happy to give every assistance in it's power, to any person who may be desirous of improving his breed of cattle, sheep, &c. or of trying any useful experiment in Husbandry.

LONDON, 12
June 1794. S

LETTER

TO

SIR JOHN SINCLAIR, BART.

PRESIDENT OF THE BOARD OF AGRICULTURE,

RESPECTING

THE SURVEY OF NORTH WALES.*

SIR,

IN obtaining an account of the present state of husbandry in North Wales, several difficulties occurred. Among others, no distinct map of it could be procured, although I enquired at all the shops in the principal towns, from Edinburgh to Chester. The only one I could obtain, was very obligingly furnished me by a gentleman in the last mentioned city; but it was old and indistinct; also the season of the year in which I commenced the survey, was by no means favourable.† In some instances, no opportunity was allowed me, either of showing or of explaining the plan of the board; and when it was, I sometimes found gentlemen averse from the scheme. These circumstances will account for what, to many readers, may appear material omissions in this performance; and will, I hope, be some apology for the many mistakes or inaccuracies into which I may have fallen. All these defects, I trust, will be supplied when the account is circulated in the different counties to which it refers.

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* The whole of North Wales having been surveyed by the author, this letter applies to the whole of his Reports.

† Mr Kay was appointed late in the season, in consequence of an accident having happened to the person who was originally nominated for that purpose, which prevented his fulfilling his engagement.

I beg leave to suggest to the Honourable Board, the propriety of prefixing to the survey a copy of the original plan: and I do it for this reason, that many gentlemen, who were at first shy of giving me information, were no sooner made acquainted with the object which the Board had in view, than they were convinced of its importance, and highly approved of the undertaking.

I cannot conclude without making my warmest acknowledgements to many gentlemen in North Wales, for the personal civilities which they showed, and for the information they so readily communicated. To the clergy I was particularly indebted. They not only gave me all the information, consistent with their own knowledge, but were at great pains to obtain it from others; and when I met with farmers, who did not understand the English language, (which was frequently the case) they took the trouble to act as interpreters.

If the facts which I have stated, or the hints which I have given, tend to the improvement of North Wales, or in any shape contribute to promote the views of the Board of Agriculture, it will afford to me the sincerest pleasure.

I have the honour to be,

SIR,

Your most obedient Servant,

LEITH, }
June 1794. }

GEO. KAY.

GENERAL VIEW
OF THE
AGRICULTURE
OF
FLINTSHIRE.



GENERAL VIEW
OF THE
AGRICULTURE
OF
FLINTSHIRE.

INTRODUCTION.

THIS county is of an oblong form, running from south-east to north-west, bounded by the county of Chester on the east, by Denbighshire on the south and west, and washed by the Irish Sea, and the Estuary of the Dee, on the north and north-east. A detached part belongs to it, separated by the interposition of Denbighshire, and almost encircled by Cheshire and Shropshire. This disjoined part, which consists of the hundred of Maelor Saefnog, is mostly a flat tract, though varied by gentle risings, well wooded and inclosed. Flintshire is 28 miles in length, and no where above 10 miles in breadth, generally less. The whole is divided into 5 hundreds, and 28 parishes, containing about 160,000 English acres, and its inhabitants are computed at 33,000.

The wild, rugged, and mountainous appearance of North Wales, is no where very conspicuously displayed in this county. Excepting the waste lands, it is all well wooded, and enclosed with hedges and other fences. Its surface throughout is varied by hill and dale. From the shore of the Dee, the land ascends gradually, by gentle rising arable hills, which fall by degrees into rich fertile plains. A ridge of higher hills on the south separates it from Denbighshire, which, in many places along their sides, produce corn, and in some parts are cultivated to the summit.

GENERAL DESCRIPTION.

Soil.—The soil most prevalent along the coast, and in the vales of Clwyd and Mould, is a strong clay, interspersed with gravel, loam and sand. Farther up the country, it is generally more free, consisting of gravel, loam, and sand. Clay is also to be met with of different qualities.

Climate.

Climate.—The climate is by no means reckoned unfriendly to vegetation. From the situation and narrow form of the county, extending along the shore of the Dee, the sea breezes prevent the snow from lying any length of time. Frost or snow seldom interrupts the operations of husbandry three weeks in a year. Rainy weather is the greatest obstruction, especially where the soil is clay; and yet, the seed time and the harvest are not later than in the best counties in Scotland, and more early than in many northern counties in England. Harvest generally begins about the middle of August, and frequently earlier along the sea coast, and is commonly finished in September. In the more elevated situations, it is a week, or perhaps two, later. The corn, in harvest, seldom suffers any injury from the weather, being commonly housed or stacked in excellent order. Some years, the wheat suffers a little in the spring months by frost, but very seldom by cold winds, being well sheltered by the woods and hedges. Wheat is generally sown in the months of September and October, and in dry seasons, the farmers continue sowing until the new year. The few beans and pease that are cultivated, are sown in February and March; common oats in March; Dutch and Polish oats in the end of March and beginning of April; barley in the end of April and beginning of May. The hay harvest begins about the middle or end of June; and as they cut a great quantity of natural, and some meadow hay, it frequently continues all the month of July.

Waste lands.—Although some small portions of the waste lands have lately been divided and inclosed, yet there are many thousand acres still left in their original state, which are very capable of being converted into arable and pasture lands. And, although all the waste lands or commons in North Wales, are denominated mountains, yet many of them are as level as a bowling green; and, in this county, they are, in general, not more hilly than the arable lands, nor is the soil inferior in quality, were it as well cultivated. In Flintshire, the commons
are

are depastured by sheep, black cattle, horses, and asses, belonging to the neighbouring tenants, from which no possible advantage can be derived, as the poor animals, kept in this almost starved state, can never improve; on the contrary, the loss sustained by death throughout North Wales, is incredible. There are many farmers, who, rather than risk their stock on the commons, sell their privilege at the paltry sum of 4d. a head for sheep, during the season, and for other cattle in proportion. The expence of improvement cannot be great, inclosing and draining being the chief things required. Coal and limestone are got in abundance, and at an easy rate. An acre can be well limed for 3l. Sterling, and lime, of *all* manures, is the best for land of this description. The gentlemen of this county have not been entirely remiss in improving waste lands. Two thousand acres were gained from the Dee, by embankment, about 12 years ago, the soil of which is for the most part clay, and is now rented at 20s. *per* acre. Two thousand four hundred more have been recently embanked in the vicinity of Chester, the soil whereof is a pure sand, on which a very great variety of artificial grasses have been sown, but the white clover prevails, and already produces good pasture, appearing as if it would soon equal the best in the county. From the nature of this soil, it ought never to be disturbed by the plough. To make it capable of producing good crops of corn, would require a long series of years of cultivation, besides a great command of dung, which in a short time will make the most sterile land productive, by a total alteration of the soil. There are still some lands on the sea coast, adjacent to *Flint*, capable of being embanked, to appearance about an hundred acres, which in spring tides are overflowed. At present, all that this tract yields, is a little pasture to a few meagre looking sheep, belonging to the incorporations of Flint. Some land of the same description with this, to the westward of it, was embanked many years ago, by Paul Panton, Esq; of Plasgwin, in Anglesey, which he improved; and it is now reckoned equal in value to the best land

in the county, and is consequently rented as high. There are no common fields, or fields in *run rig*, in this county, as I am informed, except between Flint and St Asaph, and it is in agitation to divide and inclose them. The difference of rent between open and inclosed fields, is estimated at one third.

Fences and Inclosures.—From the appearance of the fences in this county, inclosing has been very general many years ago. There are now very few open fields, the waste lands excepted. The fences are of various kinds; but the most common is hedge and ditch. The hedges are of the same kind with those in many parts of England, consisting of an intermixture of hawthorn, hazle, holly, bramble, brier, crab-tree, &c. They are generally old, and in many places faulty, and those faulty places are supplied by filling up the gaps with brushwood. These defects, in many instances, are occasioned by trees being planted in the hedges, or so near as to injure it. This attempt to add beauty to a hedge, is generally destructive of its utility as a fence. However beautiful an appearance a variety of plants may give a hedge, by the diversity of colours, yet thorns alone make the strongest and most durable. When the land required no drain, the custom was to bank up the earth a little; on the top of which, the hedge was planted. But in some of the more recent inclosures, the practice is to face up the bank with stone, to the height of three or four feet, according to the situation of the ground, on the top of which thorns are planted. This makes an excellent fence, when weeding and pruning are properly attended to. Dry stone walls, coped with turf, are also common; they are generally built from four to five feet high; and some of the gentlemen's seats are surrounded by stone and lime walls. No other attention is paid to the size and form of inclosures, than what is suggested by the varied surface of the country itself. The ditches are placed so as to strengthen the fence, and to carry off the water. Enclosures from five to eight acres are more generally approved of, than larger ones, as affording greater warmth and shelter to

to the fields, which thereby yield better crops of all kinds. Objections have been made to small inclosures, especially if the fence is a hedge, and the fields are in corn, from an opinion, that it is apt to harbour birds, which eat up and otherwise destroy the crop, particularly the ridges that ly contiguous to the fence. But when a hedge is regularly and properly runed, the damage sustained by them will be found as trifling as that arising from their resort to a stone wall; and the advantages derived from its shelter are evidently much greater.

Wood Lands.—This county, where the lands are appropriated, is finely interspersed with woods, and every gentleman's seat is surrounded with larger or smaller plantations; the number of acres employed in this way could not be ascertained. The woods are in general old, and very few young plantations are to be seen. The great tracts of waste lands, in different parts of this country, present a barren and bleak appearance, from the want of wood, and other necessary improvements. There are some places so rocky, as not to admit of being ploughed, but which, if planted, would soon destroy the furze, heath, &c. with which they at present abound; and if properly protected for twenty years, or perhaps less, would yield more pasture than they do at present, and in time would produce a greater profit than the arable lands. It has been a very great error in some of the counties of North Wales, to cut down the forests, without thinking of supplying their place with young plantations. The loss sustained by the island of Anglesey, and the county of Caernarvon, in this respect, is very great, and ought, therefore, to be guarded against, in this and every other county.

Rivers.—The rivers in this county are very inconsiderable. The *Allen* waters the southern part, and is only remarkable for its sinking under ground, in the neighbourhood of Mould, where it is lost for a short space. The source of the river *Clwyd* is in Denbighshire, and running through the beautiful vale

of that name, joined by the *Elw*, in the vicinity of St Asaph, on the western part of this county, it discharges itself into the sea, near Rhuddlan. The spring at Holywell, or St Winifred's well, disgoring above one hundred tons of water in a minute, is the most surprising of any in Great Britain. The fabulous story that is told of its origin, can only be credited by the ignorant and superstitious. Its utility, however, cannot be denied, as it turns the machinery of 13 mills within the space of a mile, or very little more, for manufacturing copper, corn, cotton, brass, &c. none of which are ever in want of water, in the driest months of summer; nor in the most frosty winters does it ever freeze. This situation, in regard to manufactures that require water to keep machinery in perpetual motion, cannot be surpassed; and, from its vicinity to the sea, the land carriage of goods is only 2 s. 6 d. *per* ton. This water is impregnated with different minerals, and its medicinal qualities are held in the highest estimation. Many people resort hither in the summer season for the purpose of bathing, which is said to have performed many wonderful cures.

Roads.—The turnpike roads are kept in good repair in general, but the cross or parochial roads are in a very wretched state. They are so very bad, that in many places it is difficult and dangerous to travel on horseback in winter; and to get a carriage to pass along them, appears to me impracticable. They are uncommonly narrow and low, often answering the double purposes of a road and drain. New roads are beginning to be formed, from which, when properly finished, the greatest advantages may be expected to accrue; as good roads are always the forerunners to the improvement of a country. Turnpike gates are as frequent here as in England; for there are commonly two in a stage. The public roads are made and supported by their collections, together with three days labour annually of each team in the county. Other three days should also be appropriated to the parochial roads, which, however, from their present appearance, seem to have been dispensed with. This neglect, I was told,
proceeded

proceeded from this circumstance, that many of the Gentlemen, who are trustees for the roads, very seldom reside in the county.

Obstacles to Improvement.—In so fertile a county as Flintshire, it is to be regretted that no attempts have hitherto been made to introduce green crops, without which no proper system of husbandry can be pursued; even clover and rye grass are but seldom cultivated, and then, too, in a very slovenly manner by common farmers. Few pease and beans are sown, nor are potatoes so generally planted as they ought to be. A field of turnips is rarely to be met with. I cannot account satisfactorily for the backward state of agriculture throughout *North Wales*, unless from the want of leases. The lands being generally possessed by tenants at *will*, must, on their part, consequently act as a complete bar to improvement. From this cause, the present indolence and inactivity imputed to farmers, evidently proceed. It cannot be supposed, that any person of common prudence would launch out his property in the amelioration of lands, from which he might the next year be ejected. But were leases granted on liberal terms, it would be a very great inducement to farmers to engage in the business; who, being possessed of the means, united with skill and industry, would *then* find it their *interest*, and vast improvements in the art of husbandry might consequently be expected. In granting leases, a proper rotation of crops might be pointed out, and contracts entered into, putting it wholly out of the power of the tenant to injure the lands, by a succession of white corn crops, which is the practice at present; and, in this manner, it is evident that both landlord and tenant would in the end be reciprocally benefited.

Estates.—With regard to the landed property in North Wales, from the best information I could obtain, it appears, that many of the old families possess lands in the different counties, the gross amount of which may be from 5000 l. to above 30,000 l. *per annum*. There are few of them, however, who draw a-
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bove 8,000 l. annually, from a single county, the properties running from 2000 l. to 1000 l. down to 100 l. annual rents, and many of them less. From this statement, it may be expected, that lands not lying immediately under the eye of the proprietor, should be found in a less cultivated state, than those where they themselves reside; but even *there*, they have hitherto (with very few exceptions) paid little attention to the improvements of husbandry. What they occupy themselves, is kept chiefly in pasture and natural hay; and, in those places seldom visited by the proprietors, the estates are entrusted to the management of agents, who are commonly bred to the law, and consequently totally ignorant of agricultural affairs. By this means, instances frequently occur, where plantations and fences are wholly neglected, and draining, one of the most essential requisites to improvement, but rarely thought of.

Farms.—The farms in this county are in general small, extending from 20 to 100 acres of arable land. A few amount to 300, and even more. They may average about 50 acres, employed in pasture and husbandry in equal proportions, as nearly as could be ascertained; though I am inclined to think, that more than one *half* is kept for pasture, on account of the ready sale which they meet with for their cattle from the English drovers, and because pasturage, in a great degree, exempts them from the payment of tithes. The small farmers, on the Eastern parts of Flintshire, pay more attention to the carrying of coals to Chester, (from whence that city is chiefly supplied) than to agriculture; and they trust *more* to the profits of this business, than to the produce of their lands, both for the payment of their rents, and the support of their families.

Tillage.—The lands are laid out in inclosures of various dimensions, from one to twenty acres, and the ridges are constructed in such a manner as to carry off the water, wherever the soil is inclined to wetness. Great attention is paid to the keeping of the lands dry, which is of the greatest importance in husbandry. The ridges are of many different breadths, even

even where the soil is a tenacious clay, some preferring narrow ridges, from six to ten feet, while others are of opinion, that those from 15 to 18 feet, which admit of being twice gathered, answer better. Water furrowing, and casting proper drains, both before and after the seed is sown, are well attended to. It is a common practice in this county, where the lands are a little hilly, to plough in an oblique direction, which makes it not only more easily and better performed, but likewise prevents the soil from being carried down by great floods of rain. Where the gravel, or sandy soil prevails, care is taken to keep the ground as level as possible, to make it retain its moisture. The land in general is ploughed too deep or shallow, which is a very great error, and this happens notwithstanding the multiplicity of horses used in a plough. The difference of produce, between irregular and shallow ploughed land, and that which is properly executed, will amount to at least a quarter of grain *per* acre, and frequently more. The practice of making more ploughs than one follow each other on the same ridge, should be abandoned, as neither two ploughs, nor two ploughmen, can be found to perform equal and regular work. In some parts of Scotland, where annual premiums are given to the best ploughmen, perhaps from 12 to 20 will appear on the field, to dispute the prize, which liberal encouragement has been found greatly to improve the art of ploughing.

Farm houses and offices.—Where the farms are large, the tenants are very well supplied with housing; but the smaller ones, that rent from 20 l. to 50 l. a year, of which there are a greater proportion, are very ill accommodated. They are in want of farm yards, and sheds for the cattle; the utility of which, for the purpose of making dung, is of the utmost importance, and to a skilful and industrious farmer, the collection of dung becomes a principal object. For want of accommodation, the potatoes in winter are commonly piled up in the fields, and covered with earth or straw. Nor is proper attention paid to

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the situation of farm houses, which is likewise of material importance.

Manures.—Clay marle is found in the eastern parts of Flintshire in great abundance, about three or four feet under the surface, and is laid on grass lands, for pasture and hay, in the month of November, or before winter. It is not of a very rich quality, therefore a great deal is applied, which requires the winter frost to pulverize it; and in the spring, when the lands are dry, they are harrowed with harrows interwoven with brushwood, and generally produce good crops of hay. There is also rock marle in the neighbourhood of Flint, which is most commonly applied to the barley lands, sometimes to pasture and hay, the soil gravel, yielding abundant crops. Lime is a common manure, often used by itself; sometimes lime and soil are intermixed; but the most general compost is dung, lime and soil. These are commonly laid on fallow for a wheat crop; and dung by itself is applied to grass lands, also for wheat and potatoes, where they are cultivated. Were the offices more commodious, a great deal more of this useful manure might be collected, and every method ought to be taken to increase the quantity, by feeding cattle in stables, sheds, and straw-yards.

Rotation of crops.—About 50 years ago, rye was more generally cultivated than either wheat or barley, but it is now totally in disuse, a preference being given to wheat. The returns of the crops from leay were immense, frequently twenty fold; but a continual rotation of oats after oats, was the common practice, and the land became thereby quite exhausted. It does not appear that the system of husbandry, since that period, is much improved. Wheat and oats are at present chiefly cultivated, likewise a little barley, beans, pease, potatoes and clover. Fallowing is less practised than it ought to be; but where that is practised, the rotation is as follows: 1st year, summer fallow with manure; 2d, Wheat, very commonly sown under furrow; 3d, barley, and afterwards a succession of oats, without the intervention of any green crop whatever. It is evident, that

that by this process the lands must be worn out, and then they are left to recruit by pasturage. Some farmers sow 7 or 8 lib. of red clover seed, with a few bushels of coarse hay seeds, with the last crop, from which they derive no advantage, being very commonly choaked with couch grass, and other noxious weeds. Wheat is also sown after grass with one ploughing, and followed by the aforementioned succession of oats. There are some farmers, and also a few gentlemen, who reside in this county, who, in whole, or in part, cultivate their own property, that proceed on a different plan; but even with them, a green crop seldom intervenes. This method is, 1st year to plough after pasture, and to sow oats; 2d, summer fallow, and plant potatoes where the soil admits; 3d year, wheat; 4th year, barley, sown in with grass seeds; 5th year hay, and afterwards pasture. The introduction of cabbage, turnips, potatoes, turnip-rooted cabbage, and many others, which ought always to be horse-hoed, would be of important advantage; and a crop of one of these should always succeed a white corn crop. By pursuing this method, the lands would be always kept in good tilth, free from couch grass and other weeds; and one crop would be more productive than two are by the present mode.

Where green crops are not generally cultivated, it is almost unnecessary to add, that no beneficial, or proper system of husbandry, can be adopted. In the vale of Clwyd, and many other parts of this county, where the soil is a strong clay, the following rotation I have no doubt would answer: 1st year, summer-fallow properly manured; 2d, wheat; 3d, beans, with a small mixture of pease, drilled; 4th, barley, sown in with clover and rye grass; 5th, hay; 6th, oats; and then to summer-fallow again. Instead of seven or eight pounds of red clover, as formerly mentioned, three times that quantity ought to be sown on an acre, with two bushels of the best and cleanest rye-grass seed. The horses that are necessary for the cultivation of the farm, should be fed in the house, during the season, on cut grass; by which means, immense quantities of dung would

would be preferred. This practice has never yet been adopted in North Wales, although well worthy the attention of every farmer. Lands where the soil is a strong clay, should never be pastured, as they are so apt to be poached by the feet of the cattle, and are otherwise unfit; and where this soil prevails, cows ought also to be kept in the house. Besides, whatever the nature of the soil may be, a very evident profit would arise from this practice; as the produce of one acre will be found sufficient for three working horses, for four or five months; whereas, in pasturage, the same quantity will be found scarcely enough for a single horse, for only sixteen weeks.

Rotation of crops for a friable rich soil.—First year, potatoes well dunged; 2d, wheat; 3d, beans and pease drilled; 4th, barley, sown in with clover and rye grass; 5th, hay; 6th, oats; and 7th, potatoes. When the land is intended for pasture, six or eight pounds of white clover should be added to the red.

In a moorish gravelly soil, which, from its sterility, does not admit of being so often ploughed; 1st year, oats from pasture; 2d year, turnip well dunged, or any other green crop which is found best to answer; 3d year, barley or Dutch oats, with clover and rye grass; 4th, hay, followed by pasture for five or six years, a period long enough, as the fields, after that time, generally run into fog, and consequently become less productive; they ought, therefore, to be ploughed up, and the rotation observed as before.

These rotations of crops may be varied, without any prejudice to the ground; provided always, that a white corn crop is succeeded by a green; and then green crops alone, should be cultivated, which are found best suited to the soil. The very best informed farmers differ in opinion, with regard to the most nourishing and most profitable food for cattle. But, as experiments can be made on a very small scale, and at a very trifling expence, it is the business of the farmer to make himself acquainted with that which is best calculated for his soil.

oil and climate. Those experiments, when tried, are, in general, not fairly made, as the most fertile spots are commonly chosen for the purpose, by which means, many plants which have at first been highly extolled, have afterwards fallen into disrepute. Whereas, by making them on different soils, with, and without manure, their respective real value may be easily ascertained.

Of yams, or large field potatoes, and their culture—Yams, which are a species of the potatoe, have never been introduced into North Wales. They are an excellent food for black cattle and swine; they have also been given to horses in Scotland, and were at first looked upon as a cheap and nourishing food; but, by farther experience, the farmers have found, that in this animal they are apt to produce gripes and cholics; for which reason, they have been in a great measure disused. For milch cows, they are far preferable to turnips; as neither the milk nor the butter retain the nauseous smell and taste which they generally contract, in consequence of turnip feeding; but, on the contrary, possess the same sweetness, as if produced from rich pasture or hay. Yams are cultivated in the same manner as potatoes, and the soil requires to be equally well pulverized. It is therefore necessary, that the field be ploughed before winter, and cross ploughed in the spring, as early as the season will admit, and then thoroughly harrowed. The dung should be carried out and spread, and the yams planted immediately every third furrow, at nine or ten inches apart. In this state the field ought to remain, until the plants are about to make their appearance, when it should receive a complete harrowing; by this means, many annual and other weeds would be destroyed, and before they again appeared, the rows of the plants would be distinctly seen, and ready for hand-hoeing. This should be repeated with horse-hoeing, as long as the field required it, and the whole finished with a double wrested plough, calculated to turn up as deep a furrow as the ground will admit, or the horse is able to draw. Yams grow

more luxuriantly than the common potatoes, and produce more abundant crops, even where the soil is not so fertile. An ordinary crop will yield 2 tons *per* acre; but 16 tons upon land well prepared, and sufficiently manured, are not uncommon. They are later than the common potatoe, and therefore it is necessary that they should be planted as early as possible. But being much more hardy, greater freedoms may be used in taking them up. They will keep perfectly well through the winter, even if the stem is not decayed when taken up, and the roots so green, that the skin may be peeled off with the fingers, which is not the case with other kinds of potatoes. There is no preparation for a wheat, or any other white crop, better than yams. In a field where this mode was practised, I have seen seven Winchester quarters produced from each acre, sown in the end of December. I have been the more particular in describing the method of cultivating this valuable root, as several gentlemen and farmers in North Wales mean to make trial of it.

Beans and pease.—As the drilling of beans and pease has never yet been practised in this county, it may be proper to mention, that five or six bushels are commonly sown upon an acre; and that nearly the same method ought to be observed in the culture of them, as of potatoes and yams. Three ploughings may be more than the farmer can get accomplished, as they require to be early sown; he must therefore content himself with two; but were three practicable, it would be of great advantage.

Barley.—The common method of raising barley in this county, is highly improper, too little attention being paid to the pulverizing of the soil, and no grain requires it more. The present practice with ordinary farmers, is, to sow barley upon one spring furrow, and sometimes two are allowed; on the contrary, the ground ought always to be ploughed before winter, which exposes the soil to the frost and air; and, in the spring, previous to its getting the seed furrow, and when the land is sufficiently

sufficiently dry, it should again be stirred up, and well harrowed. If it could be ploughed twice before that time, so much the better, and the expence, by an additional produce of perhaps ten or twelve bushels *per* acre, would be more than amply repaid. Another good effect would be, clearing the field of couch grass; and when clover is sown, it would run no risk of being choaked which is too frequently the case at present.

Oats—This grain is very generally sown upon one spring furrow; when Dutch oats are cultivated, two are sometimes given. The ruinous practice of sowing oats after wheat or barley, for four or five years successively, has already been taken notice of.

Corn measure.—A *measure* contains 40 English quarts, and 16 measures make 1 hobbet. Corn is also sold by weight.

8 score and 8 lib. is allowed for the hobbet of wheat.

7 do. 7 do. - - - barley.

5 do. 5 do. - - - oats.

When grain is sold by measure, 1 hobbet to the score is universally given, but when sold by weight, no scorage is allowed.

Prices of grain.

Wheat, in November 1793, sold at 18s. *per* hobbet.

Barley, - do. 5 6 *per* do.

Oats, - do. 3 6 *per* do.

It is supposed that prices will still go higher, although the medium for 10 years back has been, for wheat 17s. barley 4s. 6d. and oats 3s.

Hay sold this year as high as 4l. 10s. *per* ton; the common price is about 3l.

I cannot help remarking, that the price of wheat is greater in proportion to that of other kinds of grain in this county, than ever I have known elsewhere. This, in some degree, may account for the farmers sowing that grain on land not in proper order for it; and the uncertainty arising from the want of leases, may also be a great inducement to that pernicious practice.

Hay.

Hay.—In this county, natural and meadow hay are preferred to artificial, and for this seemingly extraordinary partiality, a few very obvious reasons may be adduced. In the *first* place, it is evident, from the specimens I have already given of their culture, that from the treatment of the land, previous to its receiving the grass seeds, it is impossible it can be in that proper state of cultivation which is fitted to render an abundant crop of artificial grass; nor, indeed, can this crop properly be called artificial, the ground producing a greater quantity of couch grass and other weeds, than of that which was sown. And in the *next* place, whether proceeding from ignorance or inattention, the farmers generally allow the hay to remain so long upon the ground before it is cut, that the juices are perfectly dried up. Besides, the quantity of seeds sown on each acre, as was said before, is by much too small; for instead of seven or eight pounds of red clover, there should not be less than twenty; and where it is intended for pasture, eight pounds of white clover *per* acre should likewise be added. Grass seeds are generally sown with barley or oats. Where no Dutch or Polish oats are cultivated, barley is the most proper for this purpose, as it does not require to be sown so early as common oats; consequently affords more time to have the ground cleared of weeds, and the soil better pulverized, by being frequently ploughed and harrowed. They may be sown with Polish or Dutch oats, which are not so apt to lodge as barley, in the end of April, or beginning of May, which likewise affords time enough for the preparation of the land. It is an excellent method to sow grass seeds with flax, not only from its being an early crop, but also from its requiring to be weeded and pulled, which serve as hoeings to the land. The great object to be attended to in the making of hay, is the using every possible method to preserve its colour and natural juices, without which it must lose a great deal of its nourishment. It should, therefore, be cut before it begins to seed, and put into very small ricks as quickly as possible; for, by allowing it to stand too

ong, the loss is not only in colour and quality, but likewise in quantity. In Flintshire, a ton of hay is seldom produced from an acre, unless where the field has got a good dressing of dung, or other manures, when probably two tons may be raised. In England and many parts of Scotland, where the farmers make the proper cultivation of their lands a greater object; three tons *per acre* are frequently produced, sometimes more, and afterwards a good second crop, besides foggage. Great care ought also to be taken, in preventing the cattle from sootching the fields that are sown with grass seeds; in wet weather, indeed, they should never be allowed to set a hoof upon them, until the crop is cut, when the land becomes more firm or solid, as the loss sustained by it is frequently very great. What in this county, and in others in North Wales (although improperly) is denominated rye grass, is a mixture of seeds got from a coarse, foul hay rick, of which three or four bushels are sown upon an acre. This is evidently a very bad plan, as it fills the land with weeds. The greatest care ought therefore to be taken, to procure the best and most genuine seeds. I shall only mention, that seeds of all kinds are very apt to degenerate, if sown repeatedly on the same lands; to obviate which, it is very necessary that they should be frequently changed.

Corn and Hay-Ricks.—The attention paid to the covering of corn and hay throughout North Wales, and the methods used for this purpose, are superior to any thing of the kind I have yet met with. The thatch is laid on the rick or stack in a very superior style, and by means of ropes made of straw or coarse meadow hay, bound down in such a manner, as to make it almost impossible for the most boisterous weather to affect it. Another practice is, to have a wooden circular frame, thatched with straw. It is of a light construction, supported by four posts, placed at equal distances, and calculated to move vertically up and down, according as it is necessary to raise or to depress it. The thatch is laid on this, and sewed in the same form as the roof of a house. Under this cover the stack or rick

is piled up, and when finished, it is lowered and properly adjusted. This, besides being an excellent method for keeping the hay or corn dry, is likewise very convenient; for if the farmer should happen to have immediate occasion for any part of the rick, he has only to raise the cover, take from the top the quantity required, and then to lower and adjust it again. There is likewise another kind of cover in use, which is constructed altogether of wood, without any thatch. This is also circular, but has only one centre post, upon which it moves by means of a screw. It is always painted, to preserve it from the effects of the weather. This, however, is the most expensive of the two, and therefore not so commonly used.

Implements of Husbandry.—In Flintshire there are two kinds of ploughs in general use, the Rotheram, and another perfectly similar to the Scotch plough, with a beam of seven feet long, and otherwise in proportion. In the eastern parts, and along the coast, the Rotheram is the most common. A plough costs 1 l. 11 s. 6 d. The manner of working the horses in the plough is extremely awkward, and in my opinion very injudicious; three or four, and frequently five, being employed, drawing one before the other. The horses are attached by means of an iron chain, from a yard to a yard and an half in length, fixed to the bridle or muzzle of the plough. A particular inconvenience attending this method is, that the horses being so far from the draught, cannot possibly pull with so much force, as when nearer it; besides, a great deal of time is lost in turning at every end of the ridge, before the plough can again be set in proper motion. This loss of time, is evident from the quantity of the work performed. Here, little more than half an English acre is ploughed in a day; whereas, in many places, two horses abreast will plough more than three times that quantity, without a driver; which of itself is a very great saving, but which, in the former case, is absolutely necessary.

Harrows.—The harrow consists of two parts, joined by an iron chain at each end, and is composed of six bulls and three floats.

loats. The length of the bull is from three feet three inches to three feet six, containing five teeth each, and generally from four feet six inches to five feet broad, drawn by two horses, often three, one before the other. The objection I made to this kind of harrow, was, that the teeth, being so close set, only smoothed the surface of the ground, instead of piercing deep enough to raise a proper mould for covering and protecting the seed. Another kind of harrow, consisting only of one part, is likewise used, but owing to the setting of the teeth, it is liable to the same objection. They have in Flintshire no rilling instruments, that system of husbandry not having as yet been introduced. The brake harrow, and the roller, are sometimes used in pulverising the stubborn clayey soils.

Wheel Carriages.—Both waggons and carts are employed for the purpose of husbandry. The waggons are generally eleven feet in length, four feet in breadth, and $2\frac{1}{2}$ feet in depth; and are drawn by four or five horses, often yoked one before the other, as in the plough. The load seldom exceeds two tons, but a draught of 30 cwt. is the most common.

The cart is about six feet in length, three in breadth, and two feet eighteen inches deep; it is very frequently drawn by three horses, the common load is 10 cwt. There are, however, carts of a light construction, drawn by a single horse, which, when the roads are in good repair, carry 16 cwt. of coals, to the city of Chester. Great improvements might be made in the construction of carriages. One horse, where the cart is light, with a nicely set iron axle, will do more work than three can do, when it is made clumsy, and with a wooden axle. A single horse, in two days, has drawn above 30 cwt. from Leith to Glasgow, a distance of 46 miles, and the road in many places very hilly. Twenty cwt. is the common load, which is carried for 20s.; and the proprietors of these carriages make money in the trade.

Rent of Lands.—The average rent of the best land lying along the coast, and in the fertile vales of Clwyd and Mould, is estimated

mated at about 20s. *per* English acre, exclusive of land tax, poor and church rates, &c. which the farmers in many places throughout North Wales pay. Farther up the county, the rent of land, including old taxes, may average about 10s. *per* English acre. I found it impossible to obtain a just estimate of the number of acres employed in pasture, husbandry, woods, and commons, there being no correct map of the counties in North Wales to be had. A gentleman is employed at present in making one, upon a very large scale, which it is expected will be published this summer. It is to comprehend the lands of every description, and will be found of very great utility. From the character of the undertaker, and the immense pains bestowed upon it, I have no doubt, but it will be perfectly correct.

Taxes.—As a proof of the heavy taxes paid in this county, I shall only here mention a small spot of ground, consisting of 13 English acres, and let at 4s *per* acre.

The nominal rent amounts only to	-	£. 26	0	0
Poors rates, 5s. <i>per</i> pound,	-	6	0	0
Church tax,	-	3	4	0
Land tax,	-	3	4	0
Assessment for roads, &c.	-	0	13	0
		£. 39	1	0

Which makes the actual rent above 3l. *per* acre. The decline of the cotton and lead manufactures is the cause why the poors rates are so very high; as formerly they seldom amounted to one half of that sum. The church rate in this county is one eleventh of the produce, in place of one tenth. This singularity has existed time immemorial.

Black Cattle.—The breeding of black cattle in this county, is made a very principal object, and much more attended to than agriculture. Of the breeds there are none distinct or pure, because, as from their near connection with England, constant supplies are brought of the most noted kinds. From 10 l. to 12 l. is the most common price of a good milch cow, yielding from

from 25 to 30 quarts of milk *per* day, for three or four months after calving, and fed on good pasture. Besides calves of their own breeding, great numbers are bought in, from the neighbouring counties, where the object is chiefly cheese. It is computed, that each cow should produce 3 cwt. of cheese in a year; but this calculation, in my opinion, is too small. At the age of three or four, the cattle not wanted for the dairy, are sold to drovers, for the supply of the English market, at the rate of from 5*l.* to 8*l.* *per* head, according to weight and quality.

Horses.—Formerly the rearing of horses in this county, was an object of some importance. Every farmer bred a few for sale, above what was necessary for his agricultural purposes; but now, the fall in prices has in a great measure done away this traffic. Of the breeds there are several kinds, adapted both for draught and saddle. The gentlemen, and better sort of farmers, have introduced a breed from England, of the draught kind, which is found to be hardy and easily reared. They are of a stout make and very active, measuring generally from fifteen to sixteen hands high. Their colour is black, which, in this county, is preferred to all others. The lesser farmers still continue to use a smaller kind, very feeble and ill shaped, three of which are employed to draw a load of 10 cwt. The practice of beginning to work their horses, before they are two years old, is a very hurtful one, being very detrimental, both to their shape and size. There is still a much smaller breed, reared on the commons, many of which are employed in carrying coals, in two small wicker baskets, to the city of Chester, and never more than one cwt. at a time.

Sheep.—There are fewer sheep in this county, than in any of North Wales. They have, however, a variety of breeds, none of which can be said to be pure, being more or less mixed with English breeds. They are domesticated, and reckoned hardy. Weight from 10 to 20 lib. *per* quarter. The fleece is shorn once a year, producing from 2 to 5 lib.; the wool is in general white, sells from 9*d.* to 1*s.* *per* lib. according to the

quality, which varies as much as the breeds. The small sheep are fed on the commons, which are always overstocked. The mutton is considered in its prime at five years old, but more frequently is killed at two or three. The ewe seldom produces more than one lamb in the year, which is dropt in the month of February, March, or April. The lambs are said to be in general well wooled when yeaned. There is very little wool manufactured in Flintshire, the greatest part being sent to England and other counties in Wales; in some of which, the manufacture of this article is carried to a very great extent. The sheep in this county are almost always fed on grass, few or no turnips being cultivated. There are instances of their being fed with a little hay, in the winter season.

Swine.—The breeding and rearing of pigs, is here considered very profitable, and is carried on to great extent; except, however, in gentlemen's families, there is very little pork used in the county. At the age of 10 or 12 months, they are sold to English drovers, and weigh commonly from 2 to 3 cwt. The price, when alive, and well fed, 21 s. *per* cwt. They generally feed them with butter milk, whey, grains, and a few potatoes, till they are seven, eight, or nine months old; when they are put in a separate apartment to fatten for the market, and then fed on butter milk or whey, mixed with barley meal. When beans and pease can be procured, a few are allowed them. Oats are seldom given, which I should look upon as an excellent substitute, when beans and pease cannot be got.

Asses.—There are a great many asses in this county, which are employed chiefly in carrying coals and sand to Chester. They are fed, or, with more propriety, they may be said to starve, on the commons.

Towns.—Of the towns, few deserve particular notice. Flint, the capital, is a small place situated on the Dee, a sea-port, without any trade. There are a few passage boats which ply between it and Parkgate, in the county of Chester, on the opposite

posite side of the river. Part of the remains of its castle are still to be seen; from the ruins of which a county goal was built about eight years ago. The assizes are held here. It has four fairs annually for blackcattle, viz. 14th February, 24th June, 10th August, and 30th November. Holywell, though in part a new town, is the most considerable of any in this county, and the most prosperous, not only from its vicinity to a great number of Calamine mines, and a variety of different mills, but also from the vast number of people that resort hither for the benefit of the waters of St Winifred's well. A great quantity of dung is collected here, by which the lands in its neighbourhood have been considerably ameliorated. It contains also two of the largest and best inns in Flintshire.

Mould is most delightfully situated, in the fertile vale of that name. It consists of one pretty long street. In its vicinity is a large cotton work, and also some corn mills; the machinery of which are turned by the river Allen, that runs close by it. Its fairs for black cattle are held on the 13th February, 21st March, 12th May, 2d August, and 22d November.

St Asaph, although a city, is only remarkable for its antiquity, being a very small place, consisting of a few detached mean houses, with a cathedral church. It is situated in the western part of this county, in the lower extremity of the vale of Clwyd. It was made a bishop's see, anno 560, by Kentigern, bishop of Glasgow, who, flying from his own country, erected a monastery here, and placed therein 663 monks, 300 whereof being illiterate, were appointed to cultivate the lands, and the rest employed in the monastery. He appointed as his successor one Asaph, from whom it received its name. This bishoprick comprehends part of the counties of Flint, Denbigh, Montgomery, Merionethshires, with some towns in Shropshire, containing in all 177 parishes. Fairs for black cattle are held here on Easter-Tuesday, 15th July, 16th October, and 26th December.

Mines and Manufactures.—The mineral productions of this county constitute the principal part of its commercial importance.

rance. Lead ore is raised in great quantities, and smelted in different parts of the county. Some of it contains so much silver, that it is extracted from it, and amply repays the expence. Lead is also rolled into sheets. There was formerly a very considerable exportation of this article, both in bars and sheets; but the high premium paid for insurance at present, has rather cramped this business. Holland and Russia are almost the only countries that have a demand for it; and the eastern parts of England and Scotland being better situated for carrying on this trade, have made a monopoly of it.

Calamine is also got in very great abundance, some of which is exported, but a great part of it is used at a brass foundery, in the vicinity of Holywell. The coal pits in the south-east part of the county, supply the inhabitants there, as well as the city of Chester with fuel. From Mostyn, the west parts are supplied, and great quantities are driven into Denbighshire. The price of coal at the Pitmouth is 10 s. *per* ton. There are besides the brass foundery in the neighbourhood of Holywell, four large cotton works, which are doing little at present; two copper mills, where bars are rolled into sheets, for the navy and many other purposes; and a copper forge. Near to Northop are potteries, where large quantities of earthen ware are manufactured, chiefly for exportation.

THE END.



GENERAL VIEW
OF THE
AGRICULTURE
OF
ANGLESEY.

GENERAL DESCRIPTION.

THIS island, which constitutes one of the counties in North Wales, is the most western. It is situated to the north west of Caernarvonshire, and separated from it by the Menai frith. The three other sides are bounded by the sea; in length 24 miles and breadth 18, containing about 200,000 acres, and the number of inhabitants is generally computed at 20,000. The lands are chiefly employed in pasture and hay, there being only about one twentieth under tillage. The face of this county is more level than any in North Wales; when travelling through it, you find the surface a little uneven, but when viewed from a distance it appears perfectly flat, excepting five very inconsiderable hills, the highest of which is Holyhead; and, when compared to the mountains of Caernarvonshire, the adjacent county, appear only as mole hills: and were draining, inclosing, and planting more general, and a proper system of husbandry observed, it would be the most productive of any in North Wales.

Soil.—The soil in Anglesey is naturally very fertile, consisting chiefly of loam, gravel, and clay. There is very little peat or moss in this county, but a great many marshes, which might be easily drained, and converted into very fine arable or pasture lands at a small expence. On the north east side, the soil is loam on limestone rock, *very productive.*

Climate.—From the want of plantations and hedges, this island is very much exposed to heavy gales of wind from all quarters, excepting the south east, where it borders on the Menai. There it is well wooded and inclosed; but in other parts, from the want of trees and hedges, the eye meets nothing in appearance but a barren and dreary waste; seed time and harvest are, however, by no means backward, as oats are com-

A.

monly

monly sown in March, and barley in April and beginning of May. Harvest generally begins in August, and is finished in September. The climate is reckoned moist and unhealthy, producing very frequently aguish complaints. This is imputed to the fogs from the Irish sea, by which it is almost surrounded. I am however rather inclined to think, that this disease arises from the great number of fens and morasses, which, if drained, would not only be a great acquisition to the proprietors, but would tend much to the healthiness of the island. From its exposed situation snow never lies here.

Wood Lands.—Although this island was once famous for its woods, it is now a received opinion that trees will not grow upon it, except on the banks of the Menai, where there are fine plantations. There are however many convincing proofs to the contrary, as there are a number of small spots, interspersed in the neighbourhood of gentlemen's seats, which, by being planted thick, and properly protected, are in a very promising condition; which clearly proves, that wood in Anglesey, if managed with proper care and attention, will grow very well. It is true, that attempts to raise trees have been made and failed; but these failures were occasioned by the want of proper fences to protect them from the depredations of the cattle, and more frequently from the small number of trees planted together. An experiment of this kind should be tried on a much larger scale; trees, in an exposed situation, ought to be planted not only very close and irregular, but also in large clumps or broad belts, with an intermixture of all the different kinds, such as oak, ash, elm, beech, plane, &c. with a great number of Scotch firs, silver fir, spruce, larch, &c. to shelter them; by this means, the trees best suited to the soil and climate would be found out. Around the edges, a thick belt of the hardiest and quickest growing timber, should be planted, such as the willow, which would very soon afford the plantation great protection. Nothing can add greater beauty to a country than plantations well

well laid out, besides the advantages they afford in point of shelter, and the profit they in time yield to the proprietor.

Draining.—Draining is the first thing to be attended to in husbandry, and precedes all other improvements, as land that is incapable of being drained, is equally incapable of being improved. This very important branch has been much neglected in Anglesey, as there are many thousand acres, very improveable, still lying in a state of nature. The opinion of the most intelligent gentlemen, and the greatest improvers is, that the lands, on an average, might, at a trifling expence, be rendered worth three or four times their present value, and, from what I saw, I am perfectly convinced of it. Paul Panton, Esq; of Plasgwin; the Reverend Mr Hughes; the Reverend Mr Williams; and the Reverend Mr Hugh Wynne Jones, with two or three others, have succeeded wonderfully by draining and inclosing; and had they planted on a bolder scale, it would have added still more to the improvements. Land, formerly not worth 6 d. and from that to 5 s. *per* acre, is now worth 20 s. to 25 s. *per* acre; and Mr Williams assured me, that his whole expences were repaid him very amply with three crops. This should be a very great inducement for gentlemen to exert themselves, by prosecuting the same plan. The farmers, I am led to believe, have not the means of improvement; and if they had, it cannot be looked for from them, as few or no leases are granted. It is therefore incumbent on the proprietors, not only for their own interest, but also for the benefit of the kingdom at large, to exert themselves in so patriotic and beneficial a work; especially as it is attended with no risk, but on the contrary, a very certain profit. Different kinds of drains are made. Ditches are cut of various dimensions, which constitute part of the fence. Under-drains are also used, into which loose stones are carelessly thrown, covered with furze or straw, previous to its being filled up with earth; and where flat stones can be got, the sides are laid with them, six inches separate, or more, covered with a stone, and above that are thrown loose stones, filled up as in the former.

This last method is thought the most durable, and more generally practised, when proper stones can be got.

Enclosures and Fences.—The greatest part of this island has the appearance of having once been enclosed, but the fences, by inattention, have fallen into decay. The common mode has been, to throw up a bank of earth of different heights and dimensions, faced up with turf, and on each side a sloping ditch, which is now generally filled up, and in some instances gorse, as it is there called, or furze, sown on the top, and where that has been properly pruned, makes a good fence. There are also some old dry stone walls, from 4 to $4\frac{1}{2}$ feet high; but neither of these fences are capable of resisting the depredations of sheep; and even black cattle very frequently make their way over them. To prevent sheep from trespassing, they are put in fetters, made of straw or lay, neatly plaited, by which the fore and hind legs are bound together, on one side. They seem to feel very great uneasiness from this bondage, and in wet weather are often galled by it. When under such restraint and pain, it is impossible they can ever thrive. On the banks of the Menai, the lands are generally well enclosed with stone and lime, or dry stone walls and hedges. I was happy to see enclosures encreasing in different parts of Anglesey, which shewed a spirit for improvement. Paul Panton of Plasgwin, Esq; has enclosed more than any gentleman in the island; he had the curiosity to have his walls measured lately, and found they amounted to above 20 miles. They are built 5 feet high, coped with a foot of stone and lime, and afterwards pointed with lime—the expence, 17s. *per* rood of eight yards.

The Reverend Mr Hugh Wynne Jones, Mr Williams, and Mr Hughes, with a very few more, have also begun to improve, by enclosing with dry stone walls, and double ditch and hedge. The expence of a dry stone wall, $2\frac{1}{2}$ feet base, and from 5 to 6 feet high, is 7s. to 9s. *per* rood of 8 yards, according to the distance the stones have to be brought. The cost of double ditch, each $4\frac{1}{2}$ feet wide at top, sloping to one foot at

bottom, and $2\frac{1}{2}$ feet in depth, the base between the ditches 7 feet, tapering to 2 feet at top,—is. 6d to 1s 8d *per rood*, besides the expence of plants. This last fence is now becoming very common; and, as they have had little practice in those kinds of fences, I took the liberty to suggest to some gentlemen, that they were placing the quicksets too high on the bank, some slanting a foot, others eighteen inches, above the surface of the ground. I went on purpose to see a fence made by the everend Mr Hughes, at very great expence. It was a bank of earth faced up with stone and lime, on each side, about 4 feet high, and from 5 to 6 feet broad, on the top of which, a hedge of hawthorns was planted, the soil gravel. The hedge appeared to make no progress, from the want of moisture, and it was also choaked with weeds. Great attention is necessary, to the keeping of hedges clean, or free of weeds; and the cheapest and best method is, to have them hand-weeded twice a-year, viz. in spring and autumn, which, if regularly attended to, a fence of this kind may be soon brought to perfection. It ought also to be regularly pruned, and dug at the back, on which cabbages, turnips, or any other green crop, may be cultivated, which is of very great advantage. By strictly adhering to this method, I have known a fence brought to complete maturity in six years, nay, even in five. The extent of enclosures in Anglesey, is extremely various, from 5 to 30 acres, and is often regulated by opinion. They are very generally understood to encrease population, not only by affording bread for the labourer, but also by being more productive, as the population of a country always corresponds with the fertility of the lands.

Farms and Rent of Lands.—The farms in Anglesey are in general very small. They are very commonly from 10 to 50 acres, and few exceed 100. They are chiefly employed in pasture and natural hay; what is employed in husbandry, is computed at one twentieth. There is no county in North Wales better calculated for raising corn and crops of all kinds, than

Anglesey, were it properly cultivated ; and there is no county grows less, Merionethshire excepted, which is almost totally a cattle county. The rent of lands in this island is estimated at 5s. 6d. *per acre*, on an average. The grains chiefly cultivated, are oats and barley. The very few fields of wheat are scarcely worth notice, were it not to remark, that they look as promising and thriving as any that I have had an opportunity of seeing this year. The common farmers cultivate oats and barley, and as many potatoes as serve their own families. Neither pease, beans, turnip, nor any other green crop, is ever attempted by them. Some few gentlemen raise a few turnip, and some clover.

Rotations of Crops.—The mode of cropping by ordinary farmers is, oats and barley alternately for a series of years, sometimes varied by a succession of oats after oats, or barley after barley, until the ground is perfectly exhausted ; when it is left in that state to recruit by pasture. In ancient times, Anglesey was the most fruitful county for wheat in all North Wales, from which it acquired the name of the *Nursing Mother of Wales* ; because, from its fertility, when other counties failed, they were amply supplied from it. Yet, at this day, there is very little of that grain cultivated. Red clover and rye grass seed are sown in with the last crop, even by common farmers ; but from the reduced and foul state the land is in, they seldom or never do any good. Some gentlemen of late have introduced turnips, and pursue a very different rotation. After fallow with lime and dung, or some other manure, they sow barley with clover and rye grass ; 2d, hay ; 3d, oats ; 4th, turnip ; 5th, barley, with clover as formerly. In some instances, wheat is sown after summer fallow, and likewise after clover, which is succeeded by turnip, and next crop barley with grass seeds ; white clover is commonly sown if the field is intended for pasture. Summer fallow is never practised by farmers, and very seldom by gentlemen, unless when the land is so foul, that scarcely any other mode can rid it of the couch grass and other
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noxious weeds. Six times the quantity of hay is produced by following this plan, instead of the old method, when, from 7 to 25 years, they cut the same field every year for hay, which, in consequence, notwithstanding the fertility of the soil, produced very scanty crops: a very great proportion of this island is exceedingly well adapted both for corn and hay; and above four times the quantity might be raised, were that attention paid to the culture and rotations of crops, which their importance require.

The cutting of a field for hay every year, is the most absurd plan ever practised; for, by cutting it and pasturing it alternately, one year will yield more hay than two; and it is astonishing, by following that method, the land should produce a crop worth the expence of cutting and drying. Land employed in pasture for 25 years, or even above the fourth part of it, must be very unprofitable; as it commonly begins to run into fog or moss after 6 years, and at that period, if ploughed, will produce six times more value in corn and other crops for a few years, than in either pasture or hay; and when laid down with grass seeds, will likewise yield more abundant crops. As a proof however of the fertility of the soil, I cannot omit mentioning a small spot of ground belonging to Mr Hugh Wynne Jones, consisting only of 2 acres, of which the produce this year was sold for 15l.; the 7th crop of hay running successively without manure; the price I think was about 3l. *per* ton. It occurred to me afterwards, that perhaps the cattle had been wintered there, which is a common practice in North Wales, where they have seldom farm-yards, sheds, or proper housing for them.

The average produce of an acre of barley, $3\frac{1}{2}$ English quarts.

Ditto.	-	-	oats, 4	ditto
Ditto,	-	-	wheat, 5	ditto

Barley.—The manures are very commonly applied to the barley crop, but in a very injudicious manner, being laid out on the fields before winter, and the greatest part of it remains in

heaps until the spring, exposed to all the winter storms, by which means the most of its essential qualities are destroyed, leaving only, as a *memento*, the small spots on which the heaps lay, to know that ever the land had been manured. The tufts created by this mode do frequently more hurt than good, as they always cause an inequality in the ripening of the crop, which is often attended with very bad consequences to the farmer; for, by waiting for the late, a great part of the early is swept away by gales of wind. The proper time to apply dung or manures of almost any kind, is, when the soil is in the most pulverized state, which always is, or ought to be, before it gets the last or seed furrow; and no time should be lost in ploughing it down, to prevent its fertilizing qualities from being exhaled, or otherwise destroyed. It then intermixes immediately with the soil, and has its proper effect.

Potatoes.—The cultivation of potatoes is not so common as it ought to be. Notwithstanding the soil is generally well adapted for them, yet there are frequent importations from Ireland, especially at the small port of Amlioch, in the neighbourhood of Pary's mountain, whence large quantities of copper and copper ore are exported. The potatoes are commonly built up in the fields, and covered with earth and straw, for want of houses, where they remain unmolested; whereas turnip, being newly introduced into Anglesey, suffers a little from the depredations of the people. This island, from its natural fertility, if properly cultivated, would be able to export part of all its productions, and it is a disgrace that it should be indebted to Ireland for potatoes. I am thoroughly convinced, that were proper encouragement given to farmers, this could never happen.

Clover.—Where clovers have been tried, and sown on clean, well prepared land, they have been found to answer beyond all expectation, both in regard to hay and pasture; 8 lbs. of white is commonly mixed with 12 lbs. of red, when the land is intended for pasture; but, by the mode practised by ordinary farmers, their seeds are lost, from the foul state their land is in. It is a well known fact, that where land has never been sowed

fore with clover, less seed will answer, than where it has been frequently repeated. But in Anglesey, were the land in the very best order, too small a quantity is commonly sown, not exceeding 8 lib. of red clover on an acre.

Turnip.—A few fields of turnip have of late years been cultivated in this island; the produce of some of the crops was valued at 6 l. *per* acre, sown in broad cast, which is a very improper method, as the ground is seldom well cleared of weeds, nor can the crop be so regularly thinned by common country servants. They should therefore be sown in drill, so wide as to admit of being horse-hoed, by which means the land would be completely fallowed, and the crop more easily and more equally thinned. The objection to the raising of turnip, is, that they are stolen in the night time; whereas potatoes, which are never housed, but dug and piled up in the driest parts of the fields, covered with earth and straw mixed, being more common, are left untouched. This evidently shews, that were turnips more generally cultivated, the people would become more familiarized to them, and consequently the crop would be less liable to their depredations. They are not carried off for cattle, but eat by the people themselves, very frequently on the spot. As winter-feeding for sheep, they are found to be the best and cheapest. But for black cattle, many other substitutes, not liable to that objection, might be introduced; such as yams, cabbage, turnip-rooted cabbage, &c. which are considered by many experienced and intelligent farmers, as more profitable, and much more nourishing food. As a great number of cattle are reared in Anglesey, and winter food is frequently very scarce, green crops are therefore a great object in that point of view, as well as for the amelioration of the lands; and should engage the attention of both the proprietors and farmers.

Farm Houses and Offices.—The state of farm houses and offices, is in general very wretched in this county. From the want of a sufficiency of houses and farm-yards, the cattle are kept constantly in the fields, where a little straw or hay is allowed

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them for their subsistence in the winter time, by which means there is no opportunity of making dung, an article of the very greatest importance in husbandry. A small byre or cow-house, for a few milch cows, and a stable for the working houses, are all they have. Lord Bulkeley; Paul Panton, Esq; and the Reverend Mr Hughes, have lately begun to improve the farm houses and offices upon their estates, by building necessary sheds, and proper farm-yards, &c. sufficient to contain their whole stock of cattle; by which means a great quantity of dung may be collected; and it is to be hoped, that this plan will soon be adopted by all the proprietors of the county.

Manures.—Lime and shell sand are the principal manures; a very small quantity of dung is made, from the want of conveniences. Compost dung hills are sometimes made, consisting of shell sand, dung and soil, or lime, dung and soil. The earth for making compact dung hills, most commonly used, is the banks of old fences. Dung and lime are very seldom applied by themselves; but shell sand very frequently: rock marle is also got in different parts of this island, but rarely used. Shell sand is found in different parts of the coast, but by far the richest at red wharf bay, in the north east side of the island; It is composed of from $\frac{2}{3}$ to $\frac{1}{2}$ of grated shells, with a mixture of sand. About 2 feet below the surface, is the most fertile, being more impregnated with salt. It is held in so high estimation, as a manure, that it is carried round to different parts of the island in sloops; and into the interior parts of the county, for 10 or 12 miles, in carts and waggons, and is found fully to defray that great expence. The effects of it are seldom visible the first year it is applied; but the second year, and for eight years afterwards, its enriching qualities are perfectly evident, without the assistance of any other manure whatever. It is undoubtedly a very great acquisition to this island; and were a proper system of husbandry pursued, it would be inestimable. Limestone is in so great plenty, that the roads in many places are made of it, and lime is found to answer extremely well, particularly

particularly on the lands lately drained and improved ; but the want, or rather high price of coal, necessary for the burning of the limestone, makes it less frequently used. Paul Panton Esq; has a seam of coarse coal, which answers for burning limestone on the spot ; but, from its quality, will not bear the expence of carriage to any distance. Were that pit sunk deeper, there is little doubt of finding a better seam of coal, which would be of great advantage to the county, where fuel is so very scarce and dear.

Fuel.—With regard to fuel, there is no county so badly supplied with that very necessary article, as Anglesey. Peat or turf are so very scarce, and coal at so extravagant a price, that the poor people are unable to purchase them. Dung is picked off the fields, which they dry, and use with the surface of the commons for fuel. There is only one coal pit, as yet discovered in the island, from which 10 tons *per diem* is raised, and sold at 16s. *per* ton at the pit mouth, which is by no means equal to the consumption of the county ; and, when driven to any distance, comes equally high with the sea-borne coal, which pay a duty of 5s. 6d. *per* chaldron of 26 cwt. excepting those that are used at Pary's mountain for the copper works, which are exempted from the duty. The price, including duty, is from 22s. to 24s. *per* ton.

Tillage.—There is less land under this description in Anglesey, than in any county in North Wales, although there are few or none better calculated for it. It is supposed that there are only 10,000 acres in the whole island. The practice of allowing the fields to lye so long in grass, is very unprofitable ; because, by being ploughed at proper periods, they will be found to yield much more abundant crops of all kinds. The form of the ridges is in general very little attended to in this county, except the few fields that have been recently improved, where the nature of the soil, and the situation of the ground, regulate both the shape and size. In clay soil, some prefer narrow ridges, others give the preference to those that are so broad, as to admit of being twice gathered, previous to their being sown, to prevent

prevent the water from lodging, by throwing it off into the furrows; and in a dry or gravelly soil, they are laid quite flat, so as to retain the moisture. But the mode of ploughing is very exceptionable, the furrow being broad and very shallow, seldom exceeding $2\frac{1}{2}$ inches in depth, which is turned over perfectly flat, without a proper shoulder for the harrows to act upon, for the purpose of producing a proper mould, for covering and protecting the seed. The reason assigned for this method, is, that the soil is thin; but this practice is very common throughout the whole island, even where the land will admit of almost any depth of ploughing. On the north east parts, and some other particular spots, the soil is rather thin, but it will allow of being ploughed much deeper than it generally is, which, if practised, would be found of vast advantage. Great attention ought also to be paid to regular ploughing. It is almost impossible to plough the land clean, by so shallow a furrow; parts of it must be baulk'd or missed, which produce nothing but weeds. Besides, by irregular ploughing, a great deal of seed frequently perishes, falling into the cavities. Two horses abreast are sometimes used in a plough in Anglesey, but more frequently 3 or 4, one before the other, as in Flintshire. The only reason I ever heard attempted to be given for this strange mode of working the horses, was, that they go faster in a line, than abreast. This however does not appear to be the case, as a plough seldom does above half an English acre, whereas two horses abreast, *without a driver*, can do more than 3 times as much, which is a very considerable saving. Oxen are seldom employed for the purposes of husbandry. There may be some instances, where sufficient objections may be made against them; but I am convinced, that they ought to be very generally used in the different counties in North Wales. The difference of first cost, and the difference of keeping, between an ox and a horse, is very considerable; besides, an ox of 3 or 4 years old will improve, although wrought for 3 or 4 years, if he is properly fed; and a grazier will give 2 or 3 pounds more for him,

him, when it may be proper to sell him, than he would before. There are very evident proofs of the advantages of employing oxen, where it can be done with propriety. They are as docile, and as easily trained to work as a horse, and two oxen in harness, instead of the yoke, will do nearly as much work in the plough, *even without a driver*, as a pair of horses. They also answer very well for a waggon, or team, when properly bodied, provided the distance they have to travel is not very great. But horses are no doubt better calculated for long journeys. When the soil is thin and on rock, they are far preferable to horses, being more steady, and full as tractable, and as green crops, which are very much wanted in this country, should be their principal food, both summer and winter, it ought to be a very great inducement to employ them. The only objection, or rather reason, given against employing oxen in Anglesey, is, that the servants have a great aversion to the using of them, being long accustomed to horses; but if the gentlemen or farmers see it their interest, which undoubtedly it is, that prejudice would soon be got the better of by perseverance; as there is scarcely any new scheme whatever, however laudable it may be, but meets with some opposition at first.

Watering or Flooding of Land.—Very important advantages have been derived from the watering or flooding of land, in some of the counties in North Wales; but it has never yet been attempted in Anglesey, although there are many thousand acres, where this operation is perfectly practicable. It would be peculiarly advantageous for this island, were that plan adopted, winter and spring food for cattle being frequently very scarce. Early spring food for cattle, in any county, is of very great advantage; but in a county like this, where breeding and rearing of cattle is the principal object, it is inestimable. Winter food is also of the greatest importance, which can likewise be raised at a very cheap rate, by following this plan, as great quantities of hay may be easily produced. The expence of

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making the original cuts may cost about 20 shillings *per* acre, and may be afterwards kept in good order, for a shilling or two *per* acre annually. The chief thing to be attended to, in performing this operation, is the equal distribution of the water along the surface, which is easily done by paying proper attention to the levels, and laying out the field in such a manner, that it will receive the water equally.

It is a fact well ascertained, that in Merionethshire there is land that was formerly not worth 6d. *per* acre, but being now drained and flooded, besides affording excellent pasture till the 1st of June, produced two tons of good hay, cut in the beginning of August. This, in my opinion, should be a great inducement to the gentlemen to try it; the farmers, being generally without leases, will never think of attempting it. Maldreath marsh, in this county, consisting of 3 or 4,000 acres, (the embankment of which, from the sea, is about being finished) when completely drained, might almost all be flooded, which would be the greatest improvement it is capable of. Dulas bay on the opposite side of the island, containing nearly as many acres as Maldreath marsh, might be very easily embanked and flooded, which would be a very great acquisition. There are many places of less magnitude, very capable of the same improvement, as the island is watered by a great number of rivulets, very fit for the purpose.

Waste Lands.—The commons, or waste lands, are computed at 5,000 acres, and no division of them is as yet proposed. They are depastured chiefly by sheep, and some of them are inclosed, not with a design to improve the commons, but to prevent those poor starved looking animals from committing depredations upon the adjacent fields. In some places, stone is got fit for millstones, and two guineas are paid for each that is made, which is applied to the support of the poor of the parish. The commons in this island are by far the most sterile of any in North Wales; and the cause of it is, that although there are some counties as ill provided with coal, yet peat or turf for fuel

more plentiful than in this. The poor people in this county are therefore under the necessity of paring the surface of the ground, which they dry for fuel, and use along with the dung of the cattle, which they pick off the fields ! It is almost impossible to mistake a common in Anglesey, from its bare appearance, being so much pared. The cutting down of all the old woods, without supplying their place with new plantations, has been attended with a very great loss, as the people might have been supplied with fuel from them, without being under the necessity of robbing the country of its soil and manure. This practice has been severely felt, and complained of. The greatest improvements that can be made on the waste lands, are, in my opinion, to enclose and plant them ; the thinnings of which, in a few years, would not only produce a great deal of fuel, but also pailing for the protection of fences, an article very much wanted ; likewise, would afford shelter to the fields, and in time become very valuable to the proprietor. Draining, in many instances, is absolutely necessary ; and from what I heard and saw of the commons, there is no great quantity capable of being converted into arable lands, excepting those places that could be easily drained, which would be found to be by far the most fertile.

Implements of Husbandry — The plough most commonly used is perfectly similar to that in Flintshire, and indeed, in all the counties of North Wales. The length of the beam is frequently 7 feet ; and, from the point of the sock to the after part of the head, above 4 feet. The other parts are in that proportion. A plough of this sort may answer very well, for turning up rough, stiff, and stony lands ; but, in this county, they are used for the most tender soil as well as the most stubborn. The great length of head sock and mould-board, must cause an unnecessary friction, and therefore more horses are required than in a plough better constructed, and of smaller dimensions. But to add still more to the draught, an iron chain is fixed to the muzzle or bridle, at the point of the beam, 3 or 4 feet long, as

is done in Flintshire, which is a very absurd practice. I have already mentioned that 3, 4, and sometimes 5 horses, are employed in a line, which is equally improper and injudicious. The Rotheram plough is also used by a few, but not without the bridle; and commonly the same string of horses employed. This is a very common practice throughout North Wales, and requires to be corrected.

The harrows in this island are also constructed in the same manner, as those in Flintshire, consequently liable to the same objection, of being too close set in the teeth. Waggon and carts are also similar.

There are no drilling machines; that mode of husbandry never having been practised, not even in sowing turnips.

Fanners, or winnowing machines, are rarely used, there being very few in this county; the corn is commonly cleaned between the barn doors, or in the open air.

No threshing machines are as yet introduced into North Wales; furze, or gorse, as it is called, are given to horses instead of oats. It is considered as very good food by them that use it, besides a very considerable saving. This practice, however, is not very common, as many farmers disapprove of it, thinking it makes their horses perspire a great deal, by which means they are much weakened; to prevent which, some allow their horses half the ordinary quantity of oats along with it. A gorse or furze mill can be erected for from 30 l. to 40 l. the machinery driven by water, and one man cutting, and another attending the mill, can supply from 20 to 25 horses a day with that food.

In some instances, where there is no mill, the servants are employed to chop and bruise the gorse; and one man in a day can do as much as serve 3 or 4 horses. Wind mills are very common in Anglesey for grinding the corn; the rivers being very inconsiderable; and, from the smallness and flatness of the island, there are few water falls.

Paving

Paring and burning.—Paring and burning was a very common practice in this county some time ago; but experience has taught them to give it over, as it is now considered as a robber of the soil. I saw one field that was pared and burnt this year in Anglesey, by a farmer, which gave great offence to the proprietor, as it is generally understood that only one or two good crops can be raised by this method, and the lands afterwards reduced to a perfect *caput mortuum*. It may be noticed here, that this practice was very common in many other counties in North Wales, but after repeated experiments having been fairly made, they were found not to answer. Some parts of the fields were pared and burnt, and others not. The consequences were, that those places that had been pared and burnt produced almost nothing; whereas those that were not, produced excellent pasture. There are, notwithstanding, instances where this method may be highly proper; viz. where the soil is very deep, and also where the under stratum is preferable to that which is above, and that so thin, as to admit of being reduced by burning, producing no more ashes than will easily incorporate with the soil below, which, if a strong clay, will be found of great advantage, in making it more friable, consequently more productive.

Labour.—A farmer servant's wages are from 6l. 6s. to 7l. 7s. *per annum*; but gentlemen often give for a good servant 10l. 10s. *per ditto*, and both are allowed bed and board. Labourer's wages, in the neighbourhood of Pary's mountain, where so many are employed in the copper works, are 1s. 2d. to 1s. 4d. *per day*. In other places of this island, the common day's wages is 10d. to 1s. without victuals. Hay is generally mowed by the day, seldom by the acre, and 1s. 2d. to 1s. 6d. is paid without victuals: Corn harvest, 6d and 8d. *per day*, with victuals, and from 1s. to 1s. 6d. when they find victuals to themselves. The ordinary hours of labour in Anglesey are from 6 to 6, or from day light till dark, when the days are short.

Price of Provisions.—Mutton and beef, 3d. and 3½d. *per* lib. avoirdupois; veal 2½d.; pork is commonly sold alive at 2d. *per* lib.; a goose 1s. 6d; a turkey 2s. eggs, 4d. *per* dozen; ducks 1s. *per* pair; fowls 10d. and chickens 6d. *per* pair; a roasting pig, 5s.

Roads.—The roads in Anglesey, both public and private, are kept in better repair than any in North Wales. This county is possessed of the finest materials for making them: in many places limestone rock is applied to this purpose. They are made and repaired by the collections arising from the turnpike gates and six days statute labour of each team in the island, as is the practice in Flintshire. Want of wood is of great advantage to the roads, because, by being less confined, they sooner dry; but is a very great loss to the county, as shelter is very much wanted.

Live Stock.—Nine tenths of this island being employed as pasture and hay, the great object, consequently, is the breeding and rearing of cattle. Neat cattle is the staple; and the breed in this county is native, pure, and very hardy. An attempt was made to improve it, by introducing an English bull of a famous kind, but the cross breed having proved more delicate, was therefore discarded. Hardiness is a quality of the utmost importance in this county, where there is often a scarcity of winter food, and the greatest part of the cattle are obliged to lye in the fields all winter, from the want of proper accommodations for them. The native breed is not only preferred, on account of being more hardy, but also because it is more saleable; as the English drovers purchase them more readily, finding they answer their markets much better than the other. The annual export of black cattle from the island of Anglesey, amounts to about 10,000 head from one to four years old. The stock left on the island is computed at 40,000 head. Two drovers purchased in one year, viz. from November 1791 to November 1792, 4,786 head. The common practice is to swim them across the Menai, at Banger ferry. There are sold, from a year to a year and half old, about

1,000 average value, 2l. 15s. <i>per</i> head	L. 2,750.
9,000 from 2 to 4 years, 6l. <i>per</i> ditto	54,00.

Total annual value of neat cattle exported L 56,750.

By far the greatest proportion is disposed of at 3 years old, as they find *that* the most profitable age to sell them; the difference of price at four, being inadequate to the expence of a year's keeping. It is generally the young cows or queys that are sold at a year to a year and an half old. The weight of the Anglesey breed of black cattle at the age of 3 and 4, is reckoned from, 8 to 9 score pounds *per* quarter averdupois, when fat. But the very same breed, when allowed a few turnips for winter food, weight 11 score *per* quarter at the age of three years. The fore quarters are commonly heaviest. There are few oxen killed in the island, excepting those used in gentlemen's families. The old cows, I was informed, after being well fed, are slaughtered for the supply of the markets.

The practice of giving credit to the English drovers, who purchase the cattle, is very general through all North Wales; by which means the farmer seldom gets the money he bargains for; for when the drover returns, perhaps in a month or two, he always pretends to have made a bad bargain, or has met with a dull market for the cattle, for which reason a discount must be allowed. But what is worse, some of them become insolvent, or pretend so, by which means the industrious farmers are greatly hurt, and in some instances totally ruined. This year some of those drovers became insolvent, and paid very small compositions. Whereas, if the farmers would make a point of receiving cash for their cattle, (which is the general custom in Scotland, where a great number are sold for the English market,) they would never run the risk of a loss: indeed, cattle are generally bought with ready money all over the kingdom. This custom is not only very much against the tenant, but also against the landlord; for by far the greater number of tenants in North Wales have

have no other resource from which to pay their rents. This practice ought therefore to be immediately abolished.

Sheep.—A very considerable number of sheep are bred in this island, which are sold to drovers for the English markets. There are two distinct breeds, both domesticated. The one is said to be the native pure breed, and very hardy. The other is a cross breed by an English ram, introduced into this county by Mr Williams, about 20 years ago, as an attempt to improve the flock. This experiment, however well intended, did not answer the purpose; as I was informed that the scab, a disease peculiar to this animal, was by this means brought into this county, which was formerly unknown. The neck and foreparts of the sheep are clipped in autumn to prevent it, and also to save the wool, which is more ready to drop off, than from the hinder parts. For the cure of the scab different ointments have been applied, but the mercurial have been found to be the most efficacious, when used with caution. Pasturing on marshy wet land is considered as one cause of both scab and rot; and dry pasture is therefore recommended, not only as a preventative, but also as a cure. This shews the necessity of draining, a branch of husbandry seldom practised in Anglesey. The want of turnip, for winter feeding, is likewise the cause of diseases. These might be very easily obtained, as this county is very well calculated for raising them. The cross breed weigh from 20 to 24 lib. *per* quarter, clip about 5 or 6 lib. of wool, 5 inches long, worth 1 s. *per* lib. The pure breed weigh from 10 to 14 lib. *per* quarter, according as they are fed, producing from $1\frac{3}{4}$ to $2\frac{1}{2}$ lib. of wool, worth 1 s. *per* lib. They are shorn in June, and the colour of the wool is white: The number of ribs not attended to, in any county in North Wales. The lambing season is commonly in February and March, generally one lamb, well covered with wool when dropt. There is very little wool manufactured in the island. It is commonly sold to the people in Caernarvonshire, who make the manufacture of wool a principal branch of trade. Wethers are killed at the age of 4 years, and produce from 6 to 9 lib. of tallow. Those
bought

bought by the English drovers are generally sold at three. There is a smaller breed, brought from Caernarvonshire, which the gentlemen prefer; their mutton being reckoned much finer in quality. They purchase them in the spring, commonly at 5 years old, and when well fed, weigh from 7 to 8 lib. *per* quarter, producing 1 or 1½ lib. wool, and 4 lib. of tallow.

Horses.—The breed of horses in Anglesey might be greatly improved. They are generally too small for draught, but are reckoned remarkably hardy, and are thought better suited for the purposes of agriculture than horses heavier, or of a larger size. The same opinion in regard to the breed of horses, was long entertained in Scotland, where there was a breed not dissimilar to those in Anglesey, a squat kind, which was discovered to be too light. It was then, not above twenty years ago, that the most active, stout English stallions were introduced, which have been the means of improving the breeds very considerably, both in point of strength and figure, and has greatly enhanced their value. Four horses were formerly employed in a plough, but now two horses are found to do the work equally well, and as much of it. Were this plan adopted in Anglesey, as well as in all the other counties in North Wales,

I have not the smallest doubt but very great advantages would accrue from it. In Scotland this cross breed is found equally healthy and hardy as the old, and are as easily reared; and the difference of the expence of keeping, if any at all, is very trifling. The price of the best draught horse, bred in Anglesey, when horses were in the greatest demand, was 15 l. to 16 l. and are now reduced in value 20 *per* cent. But horses might be reared worth 25 l. or 30 l. at nearly the same expence, which is a consideration well worth attending to; besides, good horses, or horses of strength and figure, always are in greater demand in a market. Were any gentleman or farmer in this county to purchase a capital stallion of the draught kind, and even to pay one hundred guineas for him, or more, there is little doubt of its turning out a very profitable speculation, as the far-

mers could not possibly be so blind to their interest as not to employ him. The only risk is death, or being lamed, which is easily guarded against, by insuring, which is commonly done at 3 *l. per cent.* for the covering season; or 5 *per cent. per annum*, against all risks whatever. Saddle horses sell higher commonly than draught horses, but are also in less demand than formerly. This island is exceedingly well calculated for breeding horses; not only from the low rents of the lands, but also from the number of black cattle reared, which should always have a mixture of other cattle to pasture along with them, by which means the fields would be more equally depastured, the advantages of which must appear very evident.

Swine.—The island of Anglesey supplies the English market with a vast number of pigs. They are purchased by the drovers at the different markets, held at all the towns and villages in the island, where perhaps from 50 to 200 may be carried every market day. Almost every person that has a house, rears pigs; and it seems to be the province of the females to dispose of them, being generally brought to market by them. Very little pork is used in the county, except in Gentlemen's families. The pigs are sold alive at 2*d. per* pound averdupois, and reared in the same manner as in Flint, on grains, butter milk, whey, and potatoes. Barley, meal, oats, and pease, are given to fatten them for the market.

Goats.—This animal, so very common some years ago, needs now scarcely to be mentioned, as the whole race are nearly extirpated. The only goats I saw in the island were in Holyhead mountain, not exceeding twenty in number; and I was well informed there were not twenty more in the county. The high price lately obtained for their skins, has made them a little more valuable; from 5*s.* to 7*s.* 6*d.* each has been lately paid. They are used, as I was informed, for the covers of the saddles of the English cavalry on the continent.

Towns.—The principal town is Beaumaris. It is small, clean, and well built, but a place of no trade. Sloops bring in coals
for

for the supply of the inhabitants, and the bay affords good anchoring ground for ships that run into it for shelter in stormy weather. Holyhead, on the western side of the island, is totally supported by the passengers to and from the city of Dublin. It has neither trade nor manufactures; some herring and other fish are caught upon the coast. Newborough is a town in decay. Amlioch is a small sea port town, where all the copper ore and sulphur produced by the famous Pary's mountain, are exported, and all the coals for the supply of the manufacture are imported. It is only a few miles from the mountain, has a dry harbour, capable only of receiving vessels of a small draught of water. It is now considered the second town in the island, and bids fair soon to be the first.

Manufactures.—The island of Anglesey may be said to be destitute of all manufactures, excepting the copper and sulphur carried on at Pary's mountain. The bed of copper ore there is of immense extent, and thought to be the largest yet discovered; its depth being above 70 feet. It is not wrought in the common way of mining, but the ore is quarried in the same manner as stones from a rock. Part of the ore is exported, and a very great deal of it melted on the spot, which produces vast quantities of sulphur. This tract of ground presents a most barren and dismal appearance. For some miles around, vegetation is totally destroyed by the fumes of so many furnaces, which are said to be impregnated with arsenic, as well as sulphur. The seam of ore is not so rich as some I have seen; but, from the immense quantities produced, at so easy a rate, it is said to be the most lucrative of any in Great Britain. There are a number of oblong pits, which are filled with the water taken from the bottom of the bed of ore, strongly impregnated with copper, in which iron plates, or pieces of old iron, are immersed, and by this means the iron is gradually corroded, and the copper takes its place. The iron is now and then taken out, and the copper scraped off, till the whole of it is dissolved. A great quantity is produced by this operation, which is found to be of an excellent quality.

THE END.



GENERAL VIEW
OF THE
AGRICULTURE
OF
CAERNARVONSHIRE.

GENERAL DESCRIPTION.

THIS county is surrounded by the sea, on all sides, except on the east, where it joins Denbigh and Merionethshires. It is very irregularly shaped; from the peninsulated point, that runs a long way out on the south west to Greyddyn hundred, (which lies on the east side of the river Conway) on the north east, it measures about 50 miles. Its breadth is various; the broadest part does not exceed 20 miles. It contains 68 parishes, and about 307,000 statute acres. The number of inhabitants could not be ascertained.

This county presents the most rugged and truly Alpine appearance of any in North Wales, and is as destitute of woods and enclosures, as the island of Anglesey. Its centre is occupied by a number of lofty mountains; but the famous Snowdon overtops the whole.

Penmaenmaer, which is situated close by the sea shore on the north, is a most tremendous mountain. On the side next to the sea, it is a perfect rugged precipice, and a road is cut through that part of the rock, defended by a stone and lime wall, for the safety of passengers. The mail coach to and from the city of London to Holyhead, (the station of the Dublin packet boats) passes this way. The road is perfectly secure, but the loose impending rocks from above present an awful appearance, threatening to fall down, and crush the traveller below. There are several other mountains, which are entirely inaccessible, on account of their steepness, and the vast number of loose hanging stones upon the sides; but, in general, they are green, and afford fine pasture for sheep. There are many other smaller hills, interspersed throughout the low part of this county, some of which are also craggy and bare. Caernarvon-

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shire likewise abounds in lakes, some of which are said to produce the char and gwiniad, both Alpine fishes. There is, notwithstanding a great quantity of arable land, the greatest proportion of which lies along its skirts; and on the south side and south east parts, extensive tracks of low ground stretch a considerable way into the interior parts of the county, which may be easily improved, but at present are of very little value. There are also narrow deep valleys between the hills, that produce barley and oats. Creyddyn hundred, which is separated from the great portion of Caernarvonshire, by the river Conway, besides affording excellent pasture for sheep, also produces oats and barley in the valleys; and, along the coast, wheat is cultivated, reckoned the finest in quality in North Wales.

Soil—Of the soils in Caernarvonshire, the most prevalent is gravel and hard loam, where it is under culture, with a little clay and sand. There are also a great quantity of moss or peat, besides large tracks of marshy meadow lands, very capable of being drained, and converted into good arable and pasture ground, which at present yield only very scanty crops of the coarsest kind of hay.

Climate.—On the high grounds or mountains, the air is always very cold and piercing. Snowdon's top is covered with snow, at least three fourths of the year, but in the low country, bordering on the sea, the climate is reckoned moderate. The season for sowing oats is generally in March, and for barley, in April and beginning of May. Where wheat is cultivated, it is commonly sown in the months of September and October, and the harvest is very generally reaped in August and September.

Rivers.—Of the rivers in Caernarvonshire, there is none that deserves particular notice, except the Conway on the eastern part of the county; it is above twelve miles in length, and is navigable for some miles up the country. It is increased by innumerable rivulets, from the mountain of Snowdon, that look down upon the vale through which it runs, until it discharge

charges itself into the sea at Aberconway. There are a very great number of smaller rivers and brooks that run in almost all directions, by which this county is finely watered.

Of farms and their size.—With regard to the extent of farms, they are in general very small, few exceeding 60 acres of arable land, and the greatest proportion of them much less. The land is employed in pasture and husbandry. Of the arable, two thirds are in pasture, chiefly depastured by black cattle, sheep, and a few horses. Goats were formerly in great repute in this county, but are now totally dismissed, sheep being reckoned more profitable.

Leases.—Leases are as uncommon in this county as in all the others in North Wales: The lands being very generally occupied by tenants at will. It is very surprising that this should be the case, as Lord Penryhn, who possesses a very great estate in this county, had for some time been granting leases to his tenants for the space of 21 years, by which means he has doubled his rents, and I was informed that they paid more readily, and were more thriving, than those who have no leases, and only paid the old rent, which is one half. This I consider as a sufficient proof of the propriety of granting leases, and it astonished me that the proprietors did not immediately adopt that plan for their own interest. It is an undeniable fact, that many farmers, who are without leases, are afraid of improving their lands, lest they should be turned out next year, or be subjected to a much higher rent.

Rent of Lands.—As all the mountains in Caernarvonshire are common or waste land, it might be expected that the rent of land would average higher than it does. From the best information I could obtain, 3s. 6d. is about the average rent of the whole county, with the addition of public burthens, which are generally paid by the tenants, consisting of land-tax, tithes, poors rates, and six days labour of each team in the county annually, for the public and private roads. The best land along the sea coast lets at about 9s. *per* acre, and is employed in hus-

bandry and pasture. Fields in pasture, indifferently inclosed, and not properly drained, producing in many places rushes, let from 10 s. to 15 s. *per acre*; but the land that is sufficiently inclosed and drained, and laid down in good order, with clover and rye grass seeds, is worth 30 s. *per acre*. Pasture land always rents the highest, and is liable to a very trifling tithe; for instance, a mare and a foal pay only 4 d. and other cattle in proportion. In the neighbourhood of Caernarvon, there are many fine grass fields let as high as 40 s. and 50 s. and some at 3 l. *per acre*.

Tithes.—In some places of this county hay is tithed, in other places it is not. Corn is always tithed, which is considered a great bar to agricultural improvements.

Poors Rates.—Poors rates have become so very heavy a burthen in Caernarvonshire, that the gentlemen have had several meetings on the subject, and have come to the resolution of building a poors house, with work houses, in the town of Caernarvon, which it is expected will greatly lessen them.

Farm Houses and Offices.—The farm houses and offices require to be greatly amended. The farmers are not only in want of houses, sheds and farm-yards, but even those they have are frequently detached from each other. Small miserable huts are built on different parts of the farms, each sufficient only to contain a cow or two. The *inconveniency* attending this method, and likewise the loss of dung, must appear very obvious; for it is well known the greater the quantity laid together, it not only retains its strength and juices the better, but also fermentation is thereby promoted, a process absolutely necessary for this most important article in husbandry. Yet so little attention is paid to the preserving of it, by many farmers in this county, that it is carelessly thrown out, and frequently scattered about, so that its powers are totally exhausted, before it is applied to the purposes for which it was intended. Nor is any attention paid to the spot on which it is collected; it is sometimes laid on an hill, at other times on a declivity,

which means it runs off: Whereas a concave piece of ground should be made, for the purpose of its preservation.

Manures.—From the want of offices and farm yards, the quantity of dung collected is very trifling. Lime is the chief manure in use. Shell-sand is found in different parts of the coast, and applied as a manure, although not accounted so rich in quality as that at Red wharf, in Anglesey. Compost dunghills are sometimes made of dung, lime, and soil well intermixed; and the soil most commonly used, is that where potatoes have been raised, very frequently two years successively, the more to pulverise the soil. The ridges adjacent to the fences are almost always appropriated for this purpose, being more fertile, on account of the dung that is dropt from the cattle, which naturally retire thither for shelter. Dung and moss have also been tried as a manure, and have answered well; but when lime has been added, the compost has been found to be more powerful. As this county abounds with moss of all qualities, it is to be regretted that it is not more generally used as a manure. The farmers in general pay little attention to the making of compost dunghills, or even to the collecting of dung. Want of leases, and want of proper housing, are two great obstacles in the way. The great bulk of the cattle lye in the fields all winter, without any kind of shelter, and a little coarse meadow hay, or straw, is given them, as is the practice in Anglesey. It is needless to repeat again, that an immense quantity of dung is lost in this way. The same method is observed here, in regard to the driving out the dung before winter, as in Anglesey. It lies exposed to the winds and rain, by which means it loses almost all its vegetative power. It is generally applied to the fields intended for a barley crop; and the composts are more frequently used as a top dressing for hay.

Rotation of Crops.—There is no proper system of husbandry observed in this county by ordinary farmers; it is perfectly similar to that practised in Anglesey. Oats and barley are almost the only crops cultivated, with a very little wheat, along the

coast. Green crops are seldom or never raised. The common mode of cropping is, 1st, oats; 2d, barley, commonly with one furrow; and oats after oats are repeatedly sown, until the land will scarcely produce the seed. Some farmers sow in a few pounds of red clover, with some bushels of coarse meadow hay-seeds, which seldom make their appearance, from the foul and exhausted state of the land. Summer-fallow is never thought of, which, however, would answer extremely well, particularly on the strong clayey soils; but the want of leases and the tithes, deter them from ever attempting it. Potatoes are cultivated on a very small scale. I have already mentioned, that the ridges next to the fences are commonly planted with potatoes for two years successively, the better to pulverize the soil, which afterwards constitute part of a compost dunghill. Those ridges soon recover by being pastured, the cattle naturally seeking shelter under the fence, however indifferent it may be.

The Reverend Mr Ellis of Yscuberhen, whom I consider as the most active and skilful improver in Caernarvonshire, adopts a very different plan; his rotations are as follows: 1st, oats after pasture; 2d, turnip-rooted cabbage or potatoes on ground well limed and dunged; 3d barley, with 16 pound red clover, and a bushel of clean rye grass seed, when he intends to take a crop of wheat after the hay, which he sometimes does, without any other manure than the second crop of clover, which is cut, and raked into the furrows as the land is ploughed.

But if the field is intended for pasture, after the first crop of hay, he only sows 12 pound of red clover, and 8 pound of white. When wheat follows the hay crop, it is always succeeded by turnip-rooted cabbage, and the same rotation goes on. By observing this rotation, he always raises excellent crops. The soil consists of gravel, and loam, generally shallow; on part of the farm, which is most completely drained and highly cultivated, he has found lime to be of the greatest advantage to it. The parts that he first began to improve are almost converted into a loamy soil, by frequent culture, dung, and lime; and from
its

his appearance promises soon to equal the best land in his farm. Mr Ellis has made many experiments in husbandry. He has cultivated turnips, cabbage, carrots, mangel-wurzel, and many other plants, but has found the turnip-rooted cabbage to answer best with him, and the most nourishing food for cattle. He takes the opportunity of dry weather to drive them off the field, to prevent its being poached, and cuts afterwards off the roots and tops, the latter of which are given to the young cattle; they are piled up, close by the houses in which the cattle are fed, and, by being properly covered with straw, keep perfectly well, without the smallest detriment to the quality of the root. Mr Ellis means to make trial of yams as soon as he can procure seed. The gentlemen in this county have in my opinion been greatly obliged to him, for his exertions in the promoting of husbandry; and I am astonished, that none of them have as yet benefited by them. The land he now occupies was let for 4s. or 4s. *per* acre formerly; but, from its improved state at present, it is not worth less than 30s. *per* acre for pasture.

Corn Measure.—A peget is equal to an English quarter; half a peget makes a hobet, half a hobet makes a stored, and half a stored is equal to a Winchester bushel; a kibben contains 4 English gallons. The measure is not the same throughout all the county; on the east parts it is little larger.

Average produce of Corn.

Barley 7 hobets *per* statute acre

Oats 8 ditto ditto

Wheat 8 ditto ditto very little of which is cultivated.

Price per hobet.

Barley 13s and 14s. Oats 6s. and 7s. Wheat 20s. and 24s.; and feed Wheat 28s.

Hay.—Clover and rye grass would be more generally cultivated for hay, were it not for a very unaccountable opinion entertained by the farmers, that the finest artificial, or even natural hay, are possessed of less nourishment, than the coarse, rushy,

benty hay, from the marshes, which is always put up before it is sufficiently dried, that it may heat and become mouldy. This hay, say they, deprived of all its juices, makes the cattle drink a great deal more water, by which means they sooner become fat. I would not have so much wondered at their preferring natural to artificial hay; because what they consider as artificial, is a parcel of vile weeds, with a very small mixture of clover; but, even these, are certainly preferable to the coarse trash, gathered from the marshes, at a very great expence, as they cannot bear carriages, and the hay must therefore be brought off on the people's backs. Even were leases granted, and every other encouragement given, while such absurd notions are entertained, no improvement could possibly take place. This idea strikes against draining, one of the most important branches in husbandry. The price of hay cannot be easily ascertained, as it is bought by the yard of 38 inches. Hay for sale is always put up in a stack of an oblong form, of various heights and breadths, yet neither height nor breadth is measured; it is only the length that is ascertained.

Draining.—Of all the counties in North Wales, none require draining more than this, and there is none where it has been less attended to. Very large tracts of marshy land of different kinds, are to be seen, which, in their present state, are of little value, that might be converted into good arable and pasture fields, by this operation. Some parts afford a little meadow-hay, very coarse, which the farmers are extremely partial to, preferring it, as winter food for their cattle, to all other hay, which I have already had occasion to take notice of. But were these lands properly drained and flooded, which, from their situation in many instances, could easily be accomplished, on account of the numberless streams that flow down from the mountains, they would soon become more valuable than any in the county, by producing early spring food for the cattle, and afterwards ten times the quantity of hay which they do in their present state; and both pasture and hay would be found

very far superior in quality. An improvement of this kind is, no doubt, the business of the proprietors. The farmers, I believe, have neither the means, nor the inclination, but I am perfectly confident, that it is one of the greatest improvements of which this county is capable; and, with the addition of plantations, would render it very beautiful.

Watering or Flooding of Land.—The flooding of land in this county, has been tried with great success. The reverend Mr Williams of Pinter, made the experiment upon his lands, about two years ago, and the proof he has already had of its utility, makes him regret that the stream is not sufficient to water his whole estate. He intends, however, to have 100 acres under that operation next year. Mr Ellis of Yscuberhen, of whose improvements I have already taken notice, has for many years flooded as much land as his small stream could admit, and finds that flooding produces early grass, and a more abundant crop of hay, than a top dressing of dung, having made the experiment frequently on the same field. These are the only two gentlemen, that I could hear of, who have availed themselves of the fertilizing stream. Whereas, there are innumerable rivulets, flowing down the sides of the mountains into the valleys, at very regular distances, that pass along unnoticed, which, if properly applied, would be found almost equal to a stream of gold. As I will have occasion to take notice of some land in the adjoining county, Merionethshire, of a worse description, that has been drained and flooded, in a very superior style, I beg leave to refer to it.

Inclosures.—A great part of Caernarvonshire is still unenclosed. The old fences appear to have been finished in a very imperfect manner. They consist chiefly of dry stone walls, and earthen banks. The dry stone walls are commonly about 4 feet in height, and seem to have been built of the small round stones, gathered from the land. The fields that have been more recently enclosed, are fenced with dry stone walls, and ditch and

hedge, either of hawthorn alone, or intermixed with furze. The enclosures are of various sizes, (from 4 to 20 acres) according to the extent of the farm. The dry-stone walls, which are built of quarried rock, 3 feet base, tapering to 20 inches at top, cost 8s. or 9s. *per* rood of 24 feet. Earthen banks, 4½ feet high, cost 1s. to 1s. 6d. *per* rood. By enclosing, the rents are doubled, and if done in a very complete manner, they are frequently tripled. Enclosing is reckoned favourable to population.

Wood-Lands.—This county, once encumbered with woods, is now left naked and bare; except around the gentlemen's seats, scarcely a tree is to be seen, and those are not very numerous. They are all situated near the sea coast, notwithstanding of which, the plantations thrive very well, which is a proof that trees will grow in an exposed situation, if properly protected. There is no county in North Wales so deficient in woods, as this, and Anglesey. The old forests have been cut down, and it has never been thought of to supply their places with new plantations; by which means both counties have suffered greatly. It is to be hoped, that the gentlemen will soon see it their interest to plant, not only as it affords shelter to the fields, and adds beauty to the county, but because it will turn out highly advantageous to themselves.

Roads.—Throughout all this county they have most excellent materials for roads, which are made and supported by the collections at the turnpike gates, and the statute labour, as is the practice in the other counties of North Wales. The turnpike roads are in general kept in very good repair, but the parochial are very much neglected. I generally found one or two turnpike gates in a stage, and always remarked, that the person who attended could speak English, which is of great use to a traveller who is ignorant of the Welsh language.

Waste Lands.—All the mountains in Caernarvonshire, and also some part of the low grounds on the west side of the county, are commons. The mountains are chiefly depastured by

sheep, and the low grounds by black cattle. Although it is a practice in this county, amongst the tenants, to meet annually, and to determine what is the proper number of sheep which each ought to send to the mountains, (which is regulated according to the extent or size of his farm, yet) this does not prevent them from being almost always overstocked; and rather than run the risk of their stock being starved, many sell their privilege at 4 d. *per* head for the season, which is commonly from May, when they are driven up, until Michaelmas, when they are brought down. I had been informed, that it was a common practice in this county, for families to go up to the mountains, in the summer season, to attend their flocks, and to reside in huts, in which they made cheese; but, upon minute enquiry, I found that no such custom existed. On the contrary, the wethers only are sent up, and the ewes are always kept on the low grounds, with their lambs, which are commonly weaned when three months old, and put upon the best pasture. The ewes are afterwards milked for two months, which is mixed with cows milk, for making cheese. Although the mountains in many places are rocky and bare, yet there are a vast number which are green, and would afford excellent pasture, were they private property, and inclosed, which would prevent them from being overstocked. Draining is very much wanted in the lower commons, as well as planting.

Sheep.—There are two distinct breeds of sheep in this county. On the western side, opposite to the island of Anglesey, they are crossed with the breed of that island, which is considered to be more subject to the rot and scab, than the pure native breed in the other parts of this county. I am however inclined to think, that there is a little partiality in favour of the native breed, as I found upon particular enquiry, in different parts of the county, that the loss in both kinds was exactly the same; 2 *per* cent in a good, and 5 *per* cent in a bad year. The cross breed weighs from 14 to 16 pound *per* quarter, producing 9 pound of tallow. The pure native breed weighs about 8 pound

pound *per* quarter, and produces 4 pound of tallow. The lambing season is in March, April and May, seldom more than one at a birth, well covered with wool. The wedders are driven down from the mountains, in the month of July, and shorn along with the ewes; and about Michaelmas, it is a common practice to clip a little from below their necks. Shearing twice a year is never practised in this county. The average weight of a fleece, is about 2 pound averdupoise. The fleece of the crosses breed weighs more; lambs are clipped in August, and generally produce about 6 pound of wool *per* score, worth 2d. *per* pound; a good wedder from the mountains sells for 6s. and 7s.

Wool.—The wool is chiefly white, which, with a great quantity purchased from the island of Anglesey, is manufactured in this county. The finest sorts are picked out, for broad cloth and flannels, and the coarsest kinds are employed in making blankets. The broad cloth is very commonly made 7-8ths of a yard wide, and sells from 4s. to 5s. *per* yard of 38 inches. The flannel is sold from 1s. 3d. to 1s. 8d. *per* yard. The manufacture is principally carried on by the farmers and their servants, and the wool is dyed by themselves generally of a blue colour for making broad cloth, which is commonly sold to shop-keepers, and at the different markets and fairs in the county. The flannels are most commonly sold for the English market.

Black Cattle.—The breeding of black cattle in Caernarvonshire, is a very principal object. The native breed is commonly raised, being thought the most hardy, and therefore few attempts have been made to improve it. Lord Newborough's father, the late Sir John Wynne, made the experiment, and succeeded, by introducing both English bulls and cows of the best breeds, which were crossed by the pure breed of this county, and found equally hardy and much more profitable. Some gentlemen, since that period, have followed the same plan. The reverend Mr Ellis of Yscuberhen, to whom the county is so much indebted for the many experiments he has made, brought
into

the county, both English bulls and cows of the Bakewell and Warwickshire kinds, which were also crossed by the native breed of the county, and are found to be full as healthy and hardy. This breed has also been tried up the country, on the side of the mountains, and found to answer as well, as in the low grounds. They are reared at the same expence; and at 3 years old, the age at which they are commonly sold, they fetch two or three pounds a-head more than the native breed. The queys are generally sold at a year and an half old. The drovers, I was informed, are great enemies to the improvement of stock; and the reason assigned for it is, that were larger and finer cattle reared, they might meet with more rivals in the trade, which is at present in a very few hands, by which means they have both credit and prices on their own terms. I mentioned, in the report of Anglesey, that two English drovers purchased 4786 head of cattle, which is nearly one half of the annual sale of the island. They always prefer, or pretend to prefer the small native breed. But were English bulls of the finest shape and size more generally introduced, the stock would be greatly improved. This would be a great inducement to many other drovers, to come into the county to purchase the cattle with ready cash, instead of credit, which is at present the practice, whereby many an honest farmer is duped out of his property in whole or in part. The dairy is no great object in this county; a little cheese and butter is made for sale.

Horses.—A few horses are bred for sale in Caernarvonshire, besides those reared for agricultural purposes. The breed is the worst in North Wales. Racing or galloping stallions were some time ago introduced, with a view to improve it, which, however, as I was informed, has had quite the contrary effect, as a stock is produced from this cross breed, neither useful for draught, nor fit for saddle. To correct this error, no time should be lost in bringing into the county some of the most active, stout draught stallions to be found in England. The same practice prevails here, of beginning their horses to work

at a year and half old, which is too general in North Wales. All the husbandry business is performed by horses, yoked in a line, as is the case in all the other counties. Oxen are seldom employed, although some farmers approve of them, but the servants have a great aversion to work them.

Swine.—Although there are fewer pigs bred in this county, than in some others in North Wales, yet many of the farmers rear them, and find it a profitable business. They are sold alive at 2½d. *per* pound averdupois. Mr Ellis of Yscuberhen tried to rear his pigs on clover, but found it not to answer, being of too laxative a nature. He prefers boiled potatoes with butter milk and whey, as the best and cheapest food.

Implements of Husbandry.—The ploughs and carriages used in this county are perfectly similar to those in Anglesey; and the land is ploughed shallow and unequal, in the same manner. The harrows in both are also alike. Gorse or furze mills are used in some parts of the county. No drilling machines are used, except by Mr Ellis; there are very few farmers in this county, and rollers are very seldom employed.

Price of Labour.—Farmers pay the servants from 5 l. 5 s. to 7 l. 7 s. *per annum*

Gentlemen frequently give 10 l. 10 s. to 12 l. 12 s. *per annum*.

Both furnish them with bed and board.

Day labourers in spring and summer get 1 s. *per* day, and, in the winter season, 10 d. without victuals. The wages, during the hay and corn harvests, are 8d. and 9d. *per* day, with victuals. The corn is commonly cut with the sickle, except in Creyddyn hundred; the oats and barley are cut with the scythe. For threshing, 16 s. is allowed, or 10d. *per* day. The common hours of labour are from 6 to 6, or from day light until dark, in short days.

Of the servants in this county a great number are methodists; and it is a very common practice when they engage with their masters, to contract for smaller wages, that they may have the liberty of attending at all times the methodist meetings, which are very frequent. This practice is very much complained

complained of; for however necessary their attendance at work may be, yet if an itinerant preacher comes into the country, who generally preaches on the high ways, they walk off, and leave their work, to the great detriment of their masters. There is no such custom as that in any other of the counties in North Wales, as far as I know, or heard of, and it could be easily prevented in this, were the gentlemen to put a stop to those idle people coming into the country. The preachers are, as I was informed, an illiterate set of people, who come for the purpose of extorting money from the credulous; and consequently are very incapable of giving instruction; on the contrary, they are always apt to mislead.

Price of Provisions.—The price of provisions varies very much in different parts of the county. At Caernarvon, and in its neighbourhood, beef, mutton, and veal, sell from 3d. to 3½d. *per lib.* averdupois; Eggs, 6d. *per dozen*; butter, 6d. and 7d. *per lib.*; a goose, 1s. 8d. to 2s.; a turkey, 2s. 6d.; a pair of fowls, 1s.; a pair of ducks, 1s. 2d.; and a roasting pig, 4s. On the east and south parts of the county, beef and mutton, 2d. *per lib.*; veal, 1½d.; and a goose, 1s. The other articles are all nearly the same price as at Caernarvon.

Fuel.—The price of coals is very high in Caernarvonshire; but as peat or turf is got in very great abundance, the poor people feel very little inconveniency from it. 28s. *per ton* is the common price; they are brought coastways, which subjects them to 5s. 6d. *per ton* duty. It is most severely felt in the burning of limestone.

Paring and Burning.—The practice of paring and burning is totally given up in Caernarvonshire, being supposed to impoverish the soil; the tenants are therefore prohibited from it.

Run Rig.—There are no lands under this description, that I could hear of; but there is a good deal of mixed property, which might be exchanged, and thereby be brought under a proper system of management, which, in its present detached state, cannot easily be done.

Commerce.

Commerce and Manufactures.—The exportation of slates is the principal trade from this county; about 35,000 l. worth are shipped at different ports annually. The best kind is sold at 15s. *per* ton, at the quarries. Lead was formerly exported; but little is done in that way at present, on account of the war. Wool is the principal manufacture, of which I have already taken notice.

Towns.—Caernarvon, from which this county takes its name, is the capital. It is a neat, pleasant, well built town, situated on the Menai, with a castle, once remarkable for its grandeur, but now in ruins. It was built by Edward I. the conqueror of Wales, and his son, afterwards Edward II. was born in it, who was the first prince of that name, of English extraction. The gentlemen have it in contemplation, to convert part of it into a poors house. The town is walled round, and has two principal gates. It is inhabited by many genteel families, but is a place of very little trade. It has four fairs in the year, for black cattle, cloth, flannels, and pedlars wares. The concourse of people, who come from all the different parts of the county, to be present on these occasions, is very great. The city of Bangor, situated also on the Menai, is of great antiquity, and, in ancient times, was very considerable, but is now a very mean looking place, of no trade whatever. It is a bishop's see, and the principal buildings are the cathedral church, and the bishop's palace; it was formerly fortified with a castle, the ruins of which are not now to be seen. It has three fairs in the year for black cattle. Aberconway, situated at the mouth of the river Conway, on the side of a hill, is a handsome town, walled round; the castle is now in ruins. It is remarkably well situated for trade, yet neither commerce nor manufactures are carried on there. It has four fairs in the year for cattle. On the south side of this county, is a small town, called Pwllheli, a place of no trade, except a few sloops that bring coals for the supply of the inhabitants of that part of the county.

THE END.



GENERAL VIEW
OF THE
AGRICULTURE
OF
MONTGOMERYSHIRE.

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GENERAL DESCRIPTION.

THIS county, on the north, touches upon those of Denbigh and Merioneth; on the west, upon the latter and that of Cardigan; on the south upon Radnorshire; and on the east upon Shropshire. It measures about 40 miles in length, and 37 in breadth, containing about 500,000 acres; and is divided into 10 hundreds, in which are 6 market towns, 47 parishes, and about 34,000 inhabitants.

Montgomeryshire, although the one half of it is barren and mountainous, has a greater mixture of very rich valleys and plains, than many other counties in Wales. Nor are the mountains in general so high and conical as those in several other counties; on the contrary, very large tracts are to be met with, which are capable of being ploughed, and otherwise improved. They are all at present commons, undivided and uninclosed. Of the level tracts, the most considerable is that through which the Severn flows. This river (which, next to the Thames, is the most remarkable of any in Great Britain,) has its source on the south west part of this county, at Plynlimmon mountain, running in almost an eastern direction to Llanydlois, where it turns to the northward, and enters Shropshire on the east, below the Brythen hills. This beautiful vale extends all the way to the county of Cheshire, measuring above 70 miles in length; but its breadth is very various. The vales and lowlands of this county are all enclosed, and in many places there are very valuable old plantations. The lands are employed in pasture and husbandry; but pasture is the most prevalent, being liable to a much smaller tithe than the corn lands. Wheat, oats, barley, rye, pease, and some turnip, potatoes and clover, are the only crops cultivated in Montgomeryshire. It is worthy to re-

mark, that this county neither contains free stone, lime stone, nor coal in itself, but that all these very necessary articles are found, in great plenty, on the borders of some one or other of the adjoining counties, from which it is supplied. Peat or moss, for fuel, is got in very great abundance from the mountains, which lie chiefly on the west and north part of the county.

Soil.—The most prevalent soil in the vales of this county, is a very productive loam, mixed with a little gravel. The higher arable lands incline more generally to a stubborn tenacious clay, upon which lime has a most powerful fertilizing effect, when applied to fallow. The commons, or mountains, are composed of a great variety of soils, (which, in my opinion, are in many places capable of immense improvements, were they divided, enclosed, drained, and a proper arrangement of plantations to take place,) but the most predominant could not be easily ascertained.

Climate.—The climate in Montgomeryshire is reckoned very moderate in the lower parts of the county; but in the mountains, which are all uninclosed, and without any kind of shelter whatever, it is rather bleak, consequently less friendly to vegetation. The season for sowing wheat and rye is in October and November. Pease in February and beginning of March; Oats early in March; and barley in April and beginning of May. Harvest is commonly reaped in August and September, and generally *got in* in excellent condition. The operations of husbandry are seldom interrupted by long continued rains, or by snow, for any length of time.

Wood Lands.—In the numerous and extensive rich vales, with which this county abounds, there are many old plantations of oak, some of the proprietors of which are cutting them down, without thinking of supplying their places with new ones; which neglect may, some time or other, be severely felt in this county, especially when it is considered, that there is neither freestone nor limestone yet discovered, nor are there coal to burn bricks, so that wood is the only substitute for
house

house building. It is true, there are some proprietors that have not altogether overlooked the rearing of young plantations; but in a county like this, destitute of other materials for house building, it will appear very obvious that no gentleman should ever lose sight of raising trees; and as the division of the commons or waste lands is much to be wished for, a certain proportion of them might be laid out in plantations. Wood grows amazingly well in Montgomeryshire, and the few young plantations I saw, which consist of a variety of different kinds of trees, are in general better protected from the depredations of the cattle, than they are in many of the Welsh counties.

Inclosures and Fences.—The cultivated parts of this county are mostly inclosed, and the fences are in general old, consisting of an intermixture of hawthorn, hazle, crab, &c. as in Flintshire. The inclosures are of various sizes, from 2 to 20 acres, and have been found to increase the rent *prodigiously*.

Draining and Embanking.—I have again and again mentioned, in the course of this survey of North Wales, that draining ought to be the first thing attended to in farming, being the most essential. It is however as much neglected in Montgomeryshire, as in many other of the Welsh counties. There are innumerable fields to be seen, full of rushes and other aquatic plants, from the want of this very necessary improvement, which in their present state yield almost nothing; whereas, were the proprietors to drain them completely, (which might be done at an easy rate,) they would soon become as productive as the most fertile land of the county. I confess I was very much surprised to find so very little attention paid *to this*, the most useful branch of husbandry; and the more so, when I saw, in some *gentlemen's* pleasure grounds, rushes growing, that would absolutely disgrace a Scotch *farmer*. With the farmers in this county, improvement is entirely out of the question, as no leases are granted but from year to year; the covenants of which are extremely oppressive, but seldom or never insisted on. I have no doubt, however, that were leases granted on liberal

liberal terms, that the farmers would not be so inattentive to their own interest as many of the proprietors are ; but, on the contrary, it would encourage them to acts of industry and improvement in the science of agriculture. To this science, less attention has been paid in North Wales than in any country I have hitherto been acquainted with, notwithstanding its very great importance to all ranks and classes of people. As to embankment, there are many places along the banks of the river Severn, as well as some of the smaller rivers in the county, where it might be done to very great advantage. I know there are some proprietors in Montgomeryshire, that entertain a notion that an embankment could not withstand the rapidity of the rivers ; which, however, I am inclined to think a very great mistake, because in Merionethshire, the adjoining county, Edward Corbet, Esq; has embanked a large track, that not only resists the overflowing of a river, but also the attacks of the raging western ocean, to which it is exposed ; the expence of which did not exceed, upon an average, 2s. 6d. *per* yard. But we need not go to another county to refute this idea ; for in the vicinity of Welsh pool, there is a considerable track embanked, and no doubts are entertained of its stability, although situated on the banks of the Severn. There are also other tracts of land, that are very frequently inundated, and sometimes the crops are swept away, which might be prevented by embankment.

Roads.—The roads in Montgomeryshire, both public and parochial, are in the most wretched state of any in North Wales, or perhaps in Britain ; notwithstanding of which I did not see a single person employed in repairing them, which appeared to me very extraordinary, especially as turnpike gates are as frequent as on any roads in England, and I was told the collections at them were very great. There must therefore be some want of œconomy in the application of the money, or some other cause, which I cannot account for. There was one practice which I observed, that destroyed the roads *prodigiously*, viz. the manner in which the waggon wheels are shod. They are abundantly

undantly broad, but the iron is drove on, in short pieces, with large headed nails, projecting two or three inches, which not only tear up the roads, but also add great resistance to the draught; thus, more horses are employed than would otherwise be necessary, were they smoothly shod. I will venture to say, that narrow wheels, shod with a ring of iron, would do much less damage to the roads, than those done in that rough manner, however broad they may be. This mode of shoeing wheels, is very common throughout North Wales, and may in great degree account for the number of horses used in the carts and waggons. The only reason assigned for this practice is, that these long headed nails preserve the shoes of the wheels, but the nails cost more *per* hundred weight than the shoes themselves, and therefore there can be no saving; on the contrary, more horses are required, and the roads are continually harrowed up, if I may use the expression. There is no county in Britain, where good roads are more necessary than in Montgomeryshire; especially when it is considered, that that very necessary article, lime, is driven in vast quantities all over the country, and used as a manure. There are some instances where it is driven 40 miles, and coal as far. And as there are no navigable rivers, except the Severn, which only becomes navigable a little below Welsh pool, a town on the eastern part of this county, immense quantities of oak timber are carried from all the different plantations, many of which are at a very great distance from Welsh pool. These heavy carriages no doubt damage the roads, which cannot be altogether avoided from the large, weighty pieces of timber; but instead of putting two or three pieces upon one clumsy waggon, were only one placed on a waggon of a lighter construction, the roads would suffer less, and the expence of carriage would be diminished. If the funds arising from the collections at the turnpike gates, with the assistance of the statute labour, should be found inadequate to the expence of making good roads, and keeping them in proper repair, the toll or tax should be raised, which, instead

of being an additional burthen, would be found in a very great degree to diminish the expence of the carriage of every article, by requiring fewer horses ; for it is an incontrovertible fact, that one horse, on a good road, will do more work than two in a bad ; consequently, by improving the roads, goods may be brought to market at one half the expence, which is an object well worth attending to. I was told, too, that the non residence of the trustees, under whose management the roads are, was another reason why they were in so very bad a state. I have only to mention one thing, that will prove a very great relief to the roads, and of the greatest utility to the county at large, and that is a canal, which is now begun to be formed, and when finished, will be found to be one of the greatest improvements ever thought of for this county. Lime and coal will then be brought in at an easy rate, and that very weighty and bulky article, wood, besides many others, will be exported at a very trifling expence in comparison of what they are at present. The line of the canal, I understand, is to run through the most fertile parts of this county ; but having no opportunity of seeing the plan, I cannot describe its exact direction.

Waste Lands.—Full one half of Montgomeryshire, I was informed, consists of waste lands or commons, which are chiefly depastured by sheep, and innumerable ponies, with a few cattle ; and here, as in other Welsh counties, the commons are all denominated mountains, although some extensive tracks are to be seen, as far as the eye can reach, without the obstruction of a hill of any consequence. These might be converted into good arable land, (were the present mode of commonage corrected) but at present are lying in a state of nature, without the vestige of a tree or fence to screen them from the blasts to which they are now exposed. After a division has taken place, (which, for the good of the country at large, I hope is not far distant,) the first thing to be attended to, in the improvement of land of this description, is draining, and next, sufficient fences and plantations, laid out judiciously, so as to afford proper shelter
to

to the fields. Then crops might be raised, that would amply repay the expence of improvement. In conversing with some gentlemen in this county, about improving waste lands, in the manner I have now described, they treated the idea with ridicule, as being chimerical and too expensive. That there are some lands incapable of being improved, or rather, that the proper method of improving them has not yet been discovered, I will not deny. But the objections stated against the improvement of the waste lands in Montgomeryshire were, that they were bleak, and in many places abounded with moss and heath. Their bleakness may be easily accounted for, from the total want of plantations and fences; and, as to the mossy lands, I have only to appeal to the improvements made by Edward Corbet, Esq; in the adjoining county of Merioneth, to whom the gentlemen in this county ought to be very much obliged for his exertions, would they but profit by them. When he first began to improve his mossy or turbary lands, his neighbours looked upon him as a madman, and treated his scheme with the utmost ridicule, notwithstanding of which, he now draws *50 per cent per annum* for the money laid out, which is the same as buying an estate at two years purchase. Many other instances might be given, were it necessary, where moss has been highly improved; and, as rivers and rivulets abound in this county, the flooding of the mossy lands might be practised, after being properly drained; which would be attended with great success. It is a fact well ascertained, that the watering of heathy ground soon destroys the heath, and that abundance of sweet, healthy, and nourishing grass, is produced. There are many places in Scotland, where the land is now enclosed and cultivated, that formerly presented a more barren appearance than a great part of the waste lands in Montgomeryshire, and pays well for the expence of improvement. The commons in this county are in townships, and the land-marks are well known. The shepherds occasionally pay them a visit,

to prevent the animals from rambling, or going beyond their limits, which indeed very seldom happens, except in the spring months, when the mares are in season, when it is absolutely impossible to keep them within their own bounds, and is therefore very rarely attempted; but so soon as that is over, they come back to the grounds on which they used to pasture, as if by instinct. The ponies live constantly on the mountains, until they are old enough for the market, and a number of wedders also winter there, (which are looked after by some cottagers, that reside on the borders of the commons,) neither of which are allowed any other food than what they can gather, and consequently many starve in hard winters.

Watering of Lands.—The flooding of land has long been practised in this county; and although it is commonly done in a very slovenly manner, yet great advantages have been derived from it. By the general method used, you may observe some parts of the field covered with stagnant water a foot or two deep, while other parts are not touched. This proceeds entirely from carelessness, in not levelling the land sufficiently, so as to receive the water equally. Great attention ought also to be paid to the conductors, by giving them the necessary declivity and no more, and placing the stops at proper distances, so as to distribute the water very equally along the surface of the field, but this is also neglected in many instances. The difference of expence in doing a thing properly, and executing it in a heedless manner, is very trifling. And in an operation of this kind, where its greatest advantages depend on the nice manner in which it is done, it is astonishing that people should not always finish it in the most complete manner. It is entirely needless to recommend to the gentlemen and farmers of this county, the propriety of flooding their lands, as its fertilizing qualities are perfectly well known; but I shall mention one circumstance, that appeared to me to be in a great degree neglected, which is, the watering of hills and sloping grounds, and which can be done, where water can be commanded, with

greater facility than even plains; for in some of the vales, there is scarcely a declivity sufficient to keep the water in motion, which is absolutely necessary in this operation. I shall also mention, from the best information I could obtain, that the water is commonly applied for at least fourteen days, when it is diverted into another field, if practicable, and then used for the same length of time. This ought never to be omitted, especially if the stream is small, and will not afford a sufficiency of water to the whole; first one part of a field may be flooded, and afterwards the rest of it.

Farms.—The farms in this county are occupied by tenants at will, and are in general small, renting from 5 l. to 100 l. excepting a few in the vales, that amount to 200 l. and some as high as 300 l. Of the arable land, it is reckoned that one half is employed in pasture, and the other half in husbandry. The rents are very various, being from 2 s. 6d. to 50 s. *per* acre, according to the situation and quality of the soil. Wheat and oats are more generally cultivated than any other crops; and barley is more commonly raised than either rye, pease, potatoes, clover, or turnips.

Rotation of Crops.—It is impossible to say which is the most common mode of cropping in Montgomeryshire, there being such a variety of methods pursued; but I will endeavour to point out those rotations that are most generally followed. There is a custom, which prevails in this county, and in no other in North Wales that I could hear of, which is, sowing rye mixed with wheat, generally on fallow; a practice that deserves to be reprobated, as the two grains never ripen equally; the proportion is $\frac{1}{4}$ of rye to $\frac{3}{4}$ of wheat; the reason assigned for it is, that some seasons are more favourable for wheat, and others for rye, by which means they make sure of a crop of the one or the other. But where this is practised, an abundant crop is seldom reaped; as the rye is so much earlier than the wheat, it very often happens, that it is almost all shaken, before the wheat is ripe for the sickle. To save, however, as much as
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possible, some farmers plough down the shaken rye, so soon as the crop is removed, which answers as spring food for the cattle; then the field is prepared for a barley crop, with which rye grass and clover are sown. It is customary to sow 15 lib. of red, and 5 lib. of yellow clover; and when the field is laid to pasture, 5 lib. of white clover is added, and a streak of ryegrass, which contains exactly 10 English gallons, is commonly allowed to an acre. In the fertile vales, it is usual to take only one crop of grass or hay; then the field is limed and prepared for a wheat crop, which generally yields from 20 to 25 streaks *per* acre, which is sometimes followed by pease, but more frequently by oats or barley, with grass seeds. Both wheat and rye are often sown by themselves, after fallow; 2d year, barley; 3d and 4th, oats, with grass seeds. It is also common to plough up the wheat field immediately after the crop is removed, and to sow rye for spring food. Where turnips are cultivated, they are commonly sown after oats or grass. The land is ploughed before winter; and in the spring, ploughed again and again, until it is sufficiently clean; it generally receives the seed furrow in the beginning of June, when the turnips are sown broadcast, which, however, would answer much better in drill. Barley, with grass seeds, invariably succeeds the turnips. There are, however, some of the farmers that sow oats and barley alternately; and others, oats after oats, until the ground is quite exhausted. Green crops are much seldomer cultivated than they ought to be.

Corn Measure.—The corn measure varies in different parts of this county. In some places, the Winchester bushel is introduced, containing eight English gallons; but the common measure of the county is called a streak, containing ten gallons, with which wheat, rye, barley, and pease, are measured. The malt measure contains only nine gallons, and the oat measure is always heaped, and the custom is to sell seven half streaks *heaped*, which contains five gallons of water.

Prices

Prices of grain.

Wheat sold this year at, from	7s. 6d. to	9s. 0	per streak.
Barley,	5s. 6d. to	6s. 6d.	per do.
Pease,	6s. 0 to		
Rye,	8s. 0 to	8s. 6d.	per do.
Oats,	15s. 0 to	16s. 0	7 half streaks heaped.

The prices were much higher than they commonly are, owing to a short crop. Hay sold at 4l. per ton.

The average produce of wheat is 22 streaks per acre.

Barley,	23	per do.
Pease,	20	per do.
Rye,	20	per do.
Oats,	6 measures,	which is equal to 27 common streaks.

Manures.—The chief manures are lime and dung. Compost dunghills are very seldom attended to. The beneficial effects of lime, as a manure, is astonishing, which must evidently appear from its being able to defray the expence of land carriage of 40 miles. But the time is not far distant, when this county will be greatly relieved from the enormous expence of the carriage of this very useful article, as well as many others, by the canal that is now forming.

Implements of Husbandry.—I found very little difference, in respect to the implements of husbandry, throughout North Wales; only the Rotherham plough is more generally used in some counties than in others, which is the case in Montgomeryshire, and the harrows wider set in the teeth, which is an improvement. As to other implements of husbandry, I shall only mention, that there are no drilling machines; 3, 4, and 5 horses are employed in a plough, and draw in a line. Oxen are also used; but from the long carriage of lime, they do not answer so well as horses, and therefore are more seldom used.

Farm Houses and Offices—All the farm houses and offices in this county are built of oak. When the frames are finished, they are neatly interwoven with thin pieces about the size of a

pipe stove, but not quite so thick, which is afterwards plaistered with lime. There are some of them very commodious, and others the proprietors are improving; but by far the greatest part requires a great deal to be done in that way. In this, as in other Welsh counties, a great quantity of dung is lost, from the want of proper accommodations for the cattle; and the scarcity of that article is more severely felt, as Montgomeryshire in itself possesses no other manure, that has yet been discovered, which should be a very strong incitement to gentlemen to make convenient offices and farm yards for their tenants.

Labour.—The rate of wages for a husbandman in this county, varies from 6l. to 10l. *per annum* with victuals, according to his abilities; and a day labourer gets 1s. *per day* in winter, and 1s. 2d. in the other seasons, without victuals, excepting in harvest, when he is allowed 1s. *per day* with victuals.

Provisions.—The price of best beef and mutton is from 3d. to 4½d. *per pound* averdupois; veal from 2d. to 4d. according to its scarcity at the different seasons; a pair of fowls from 8d. to 1s. 4d.; ducks a pair 2s.; a fat goose from 2s. to 3s.; a turkey 2s. 6d. and a good roasting pig; 2s. 6d.

Live Stock.—The one half of this county being commons, which does not amount to less than 250,000 acres, chiefly employed in sheep walks, those animals are reared in immense numbers in Montgomeryshire, most of which are sent from all the different parts of the low country, to pasture upon the mountains. They who live at a very great distance, send only wedders and hogs, but they that are nearer, send their whole flocks. The strongest of the wedders are left there during winter, the others are brought down to the lower grounds generally about Michaelmas, and are sent up again in the spring, according to the forwardness or backwardness of the season. Sheep are the staple of this county, of which there are a great variety of breeds, none of which can be said to be a pure and distinct species, being crossed by other breeds. On the west and south parts of this county, there is a small white faced

faced kind, not unlike those of Merionethshire; and farther north and east, there is a black-faced home-breed, not much larger, which is highly esteemed for its hardiness. The breeds in the rich vales are considerably improved by English rams, chiefly from Shropshire. The sheep on the high grounds are more wild than those in the valleys, nor is their wool so fine; and the reason assigned for it is, they pay less attention to crossing the breed. The carcase, upon an average, weighs about 40 pound averdupoise; the weight of the hind and fore quarters is nearly equal. They are clipped once a year, and produce from $1\frac{1}{2}$ d. to $1\frac{3}{4}$ d. pound of wool, worth 1s. *per* pound, wool white. The more improved breeds weigh from 12 to 14 pound *per* quarter, and clip from 2 to 3 pound of wool *per* fleece, worth 1s. 2d. *per* pound, the wool also white. The practice is to shear the lambs in August, a score of which produce about 8 pound of wool, worth from 6d. to 7d. *per* pound. The lambing season is February March and April, one lamb at a birth, very seldom two, pretty well wooled when born. The wool is all manufactured in the county, principally into flannels, a great part of which I was informed was sent to Shrewsbury in Shropshire, in a rough state, to be finished, previous to its being exported. The smaller mutton is reckoned in perfection at 6 years old, and the large at 4. It is impossible to say, from the great variety of breeds, and from the different kinds of pasture, what is the precise quantity of tallow produced; but I was told, that a good wedder, well fed, yielded from 8 to 10 pound.

The sheep in this county are seldom allowed any thing but grass, except in a very severe winter, when they are permitted to eat at a hay rick. There are a few farmers that raise some turnip, of which their sheep partake along with the cattle; but the quantity cultivated in this county is so small, as to be scarcely worth taking notice of. The diseases to which the sheep in this county are most liable, are the scab, rot, and worst; the last I never heard of before, and could not get it properly defined. The staggers is another disease, which however is

not

not so common as the others. The loss one year with another is reckoned at 7s. *per* cent, and no cure has hitherto been found out for these distempers.

Black Cattle—A great many black cattle are reared in Montgomeryshire. In the champaign country the breeds are most excellent, being crossed by the best English bulls; and famous cows are also brought from England; but in the more hilly farms, the breeds might be greatly improved, were the same attention paid to crossing. It has been found that the cross breeds are equally hardy with the pure native breed, and much more profitable; but the generality of farmers in North Wales, are so much prepossessed in favour of their own native breed, that they never think of changing it. The weight of an ox, at 4 years old, fed on the hilly districts, is from 6 to 7 score *per* quarter; and at 5 years old, about 8 score, which are sold from 5 l. to 8 l. *per* head. The weight of tallow, when fat, is from 40 to 50 lib. and the weight of a hide, from 45 to 55 lib. In the vales, the cattle weigh from 9 to 11 score *per* quarter, at 4 years old; and at 5, from 11 to 13 score, and many much heavier. A pair of good cattle have been sold in this county as high as 33 l. which, after being fed in England for 12 or 13 months, were sold for 60 l. at Smithfield market. Were the farmers to raise more green winter food, the breeding and feeding of cattle would be a much more lucrative business than it is at present. The dairy is by no means a principal object in this county. The colour of the cows, most generally preferred, is a blood red, with smoaky faces.

Horses.—Montgomeryshire has long been famous for an excellent breed of horses, particularly of the draught kind, which, I was informed, were originally from England. Great credit is due to the gentlemen and farmers, for giving encouragement to the English stallions that are brought into the county, by which means their stock never degenerates. The colour most generally liked is black, and the horses are well shaped, hardy, stout and active; and when the bad state of the roads, and the

heavy draughts they have to pull, besides the long journeys they have to perform, are considered, they require every possible qualification that a horse can be possessed of. It appeared very strange to me, to see three, four, and sometimes five of these fine animals employed in a plough, working in a line, as is the general practice in North Wales. And it makes little difference whether the soil is sand, loam, gravel, or clay, or whether the fields are hilly or perfectly level; for in all these cases, the same number of horses are commonly used. There are also many saddle horses reared, of all descriptions, from the hunter down to the Welsh poney; but by far a greater number of the latter; indeed, I believe, that Montgomeryshire breeds more of those ponies, than any two counties in North Wales. They are allowed no other food than what the mountains or commons produce, and they are there kept till they are three years old, the age at which they are commonly sold. Many of them do not fetch more than 30s. and some are sold as high as three guineas. This breed, I was informed, is exceedingly hardy, but had greatly degenerated in point of shape and size. The cause of this, I was told, proceeded from a total neglect to the stallions, all of which are allowed to roam indiscriminately, both good and bad, till they are fit for sale, which practice, I believe, is contrary to an express act of Parliament; whereas formerly, blood stallions were brought from England, for the improvement of the breed, and those only were kept of the finest shape and figure, and the others were castrated to prevent them from hurting the stock. Upon the whole, this is a very useless animal, fit only for a young boy to ride upon, though it is very frequently employed as a beast of burthen, for which it is very ill calculated.

Swine.—The breeding of pigs is as common in Montgomeryshire, as in any county in North Wales. They are reared and fed in the same manner, and most of them also are sent to England.

Towns and Manufactures.—Montgomery, although the capital of this county, is a small place without trade. Welsh Pool is the most considerable town in Montgomeryshire. There is besides Newton, Llanydlos, Machunlleth, and some others of less note, at all of which, and over all the county, the woollen trade is carried on, which is the only manufacture. A new mill is erecting in the neighbourhood of Machunlleth, for carding and spinning wool; and in some of the towns are spinning jennies, (as they are called) that spin 24 threads at a time, but the wool is generally spun on common wheels. There are many capital falls of water for machinery, in Montgomeryshire, and I should consider it of vast importance, to have more mills erected for carding and spinning of wool.

THE END.





GENERAL VIEW
OF THE
AGRICULTURE
OF
MERIONETHSHIRE.

GENERAL DESCRIPTION.

THIS county is bounded, on the west, by the sea and part of Caernarvonshire; on the north, it touches Caernarvon and Denbighshires; on the east, Denbigh and Montgomeryshires; and on the south, it is separated from Cardiganshire in South Wales, by the river Dovy. Its shape is irregularly triangular, running out into a narrow point on the south west. It contains 500,000 acres, divided into six hundreds, in which are 37 parishes, and 4 market towns.

Merionethshire is the most rough and mountainous of all the Welsh counties, and presents as many rugged precipices as Caernarvonshire; yet the mountains, although more numerous, are not as high as those of Snowdon, nor are the precipices so tremendous as Penmacnmaur, and some others. This county, however, exhibits a much more pleasant appearance, from its being better embellished with woods. There are also a great variety of plains and beautiful valleys, interspersed amongst the mountains, with several large lakes, and a great number of smaller ones. The staple is sheep. Black cattle are also reared in great numbers, and some of the vales produce oats, and a little barley. Wheat is also raised on the sea coast, but in very small quantities. This county is by no means calculated for corn.

Soil.—The nature and quality of the soil is very variable. There is a vast quantity of peat or moss, and many morasses, that require to be drained; but the most prevalent soil on which the corn is cultivated, is gravel and loam.

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Climate.

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A

Climate.

Climate.—With regard to climate, there is more rainy weather and more snow in this county, than in any of North Wales; and for three years past, it has been particularly wet. The cultivation of corn must therefore be a very precarious business.

Wood lands.—This county, although better wooded than Caernarvonshire, is yet in many places very bare of trees. Oak is the principal timber raised, and the wood lands are frequently very little attended to; not only in regard to the insufficiency of the fences, through which the cattle pass, and destroy the plantations; but also in regard to pruning and thinning, both of which, though highly important, are very seldom practised. And although the tenants are prohibited, by their landlords, from keeping goats, still there are a few of those destructive animals in the county, which get over the walls, and browse upon the young plantations; and where the trees are so high that they cannot easily get at the branches, they stand erect, and pull them down, with their fore legs, holding them in that manner until they totally destroy the tree. Very few gentlemen reside in the county, to look after their own interest, which may be the cause of so much inattention. Their estates are intrusted to the management of agents, who seldom look after any thing but the rents, and thus great losses are sustained through their neglect. It is well known that wood lands, kept under a proper system, are, in sheltered places among hills, much sooner brought to perfection, than those in an exposed situation.

Enclosures and Fences.—The lands in this county are mostly enclosed, the sheep walks excepted. The enclosures are in general small, being most approved of. There are few hedges, dry-stone walls being the most common fence, some of which are built as high as 6 feet, with broad coping stones, projecting 6 inches, which however do not prevent the sheep from getting over them. They are so very active, that they run up the walls like a squirrel, especially when their pasture turns bare. Enclosing has been found to increase the rents astonish-

ingly, at least double, and frequently triple ; and it is likewise understood to increase population ; all the sheep walks, or mountains in this county, are appropriated, and the land marks are well ascertained, but no division is thought of.

Draining and Embanking.—There is a very great quantity of land that might be highly improved by draining, but as few proprietors reside in the county, it is almost totally neglected. William Oakely of Tanybwllch, Esq; has embanked and drained a most delightful vale, (which was formerly overflowed by the sea, at spring tides,) which now affords three times the quantity of pasture and hay it formerly did, and of a very superior quality. And as he will soon be able to flood it, (which he is not as yet quite prepared for, the drains being not altogether finished,) he will still increase the quantity of both amazingly. The soil in general is of a mossy nature, consequently the drains have been cast at a very small expence. The main drains are very deep and wide, and constitute part of the fence ; but the smaller or covered drains are 4 feet deep, 2 feet wide at top, and gradually contracted to 3 inches at the bottom. The cost is 4d. *per* yard. Spades are constructed for the purpose, being made narrower at the point than at the head. The top sod or turf, which is strongly matted with the roots of different kinds of vegetables, is applied as a covering to the dran with its sward turned downwards, and being properly shaped, is driven hard down, within eight or nine inches of the bottom, leaving a vacuity of these dimensions for the water. The upper part is afterwards filled with the earth that was thrown out, and because it subsides considerably, it is raised above the surface some inches. These drains last a great many years ; for after land is once thoroughly drained, it requires very little trouble to keep it free of superfluous water. Edward Corbet of Ynysymangwyn, has made very great improvements by embanking and draining. Within these last 12 years, he has improved in that way 261 acres, the average rent

of which was formerly only 9d. <i>per</i> acre,	-	L. 9	15	9
Present value 144½ acres, at 30s.				
<i>per</i> acre,	-	L. 217	2	6
Ditto, 116½ ditto, at 40s.		233	0	0
			450	2 6

The difference of value annually - L. 440 6 9

Expence of improvement.

Embanking 1980 yards, at 2s. 6d. <i>per</i> yard		L. 247	10	0
Draining 7942 ditto, 0 7½d. <i>per</i> ditto		248	3	9
Sundry other improvements	-	40	6	3
Embanking, 2310 yards 1s. 3d. <i>per</i> yard	-	144	7	6
Draining, 4510 ditto 0 7½d. <i>per</i> ditto	-	140	18	9

Total expence, L. 821 6 3

The additional rent being 44cl. 6s. 9d. is more than 50 *per cent. per annum* for his money. Mr Corbet has still a great quantity of waste land to improve, which can be done at a still smaller expence, as there is no embankment requisite. There is also a tract of private property, that lies contiguous to his, which might also be improved at a very trifling expence; and it is astonishing that the proprietor has not seen it his interest, from the improvements made by Mr Corbet. The soil of Mr Corbet's improved land was chiefly peat or moss; but by ploughing, and the application of lime, and afterwards by flooding, it is now almost converted into a rich loam.

Waste Lands.—The waste lands in Merionethshire are of very considerable extent, and by embanking and draining in some places, and by draining alone in others, might be converted into fine pasture, or hay lands; the precariousness of the weather being much against the raising of corn crops. There are about 600 acres in the neighbourhood of Torvin, adjoining the property of Mr Corbet, of which 300 acres are peat or turf, 200 sand, and 100 strong clay, which are not at present worth 6d. *per* acre; but, by being embanked and drained, might be made worth 20s. *per* acre, at least. Upon the river Dovy there are

500 acres, private property, not now worth 5s. *per* acre, but, by embanking and draining, might be made worth 2l. *per* acre; and I was informed the whole expence would not exceed 300l.

At Traeth Mawr, and Traeth Bychar, there are about 4,000 acres, which are common, and capable of the highest improvement, by embanking and draining. Harlach marsh, consisting of about 600 acres, is also very capable of improvement, and at a very small expence, as neither much embanking nor draining are required; there is likewise a great quantity of land in the interior parts of this county that requires to be drained and inclosed.

Flooding or Watering of Lands—Merionethshire is finely supplied with rivers and rivulets, for the purpose of flooding the land, yet it is seldom practised, although it is found to fertilize the soil more than any manure. Mr Corbet, of whose improvements I have already had occasion to take notice, has done more in this way than any person in North Wales. He overflows from 4 to 500 acres annually, and allows not a drop of water to escape him, that he can command; by which means he has very early spring food for his cattle, and some of his fields are grazed till the first of June, which are afterwards cut for hay in the beginning of August, producing two tons. He considers his after grass worth 20s. *per* acre. The streams of water that flow down the sides of the mountains, or sheep walks, being strongly impregnated with the dung of the sheep, must be of a very fertilizing quality. The value put upon the waste lands which Mr Corbet has improved, is certainly low, the highest being computed at only 40s. *per* acre. Whereas, from its being all flooded, and from the great quantity of pasture and hay produced, I should think it worth almost double that sum. Some farmers in his neighbouring have lately begun to adopt his plan, but on a very limited scale.

Roads.—Good roads are one of the first improvements of a country, which, however, have been long neglected in

Merionethshire; but now that work is begun, and the turnpike roads are amending daily, in all the parts of the county. They are, in my opinion, formed too narrow; for in many places they do not exceed 20 feet, in others 30. The want of funds may be the reason assigned for this; but it is not a good one, because 40 feet, which is not too broad, might be marked out, although no more of it were made than at present, which could easily be done afterwards, when the funds encrease; for it is a mistaken notion to suppose, that a narrow road is easier kept in repair than a wide one; on the contrary, a broad road is less expensive after it is once made, by allowing the carriages to shift their track, particularly in wet weather.

Extent of Farms, &c.—The lands in this county are occupied by small farmers, 100l. being a great and very unfrequent rent. The farms do not rent, upon an average, 30l. They are principally employed in pasture. Sheep is the chief object, being best calculated for a mountainous country. The farm houses are in general very bad, and almost without any kind of offices, nor have the farmers leases in general.

Manures.—Lime is the chief manure in this county, and is found to be of very great utility, where it is applied. Mr Corbet has experienced the good effects of it, in a most astonishing degree, on the lands he has lately improved, the greater part of which was peat moss; but by the application of lime and dung, with frequent ploughing, the soil seems now to be converted into a kind of black loam, which I have formerly mentioned, and is as productive as the best lands in the county. Little dung is made, owing to the want of houses for the cattle.

Crops.—Very little corn is cultivated in Merionethshire, and scarcely any green crops. Oats are the principal grain raised, with a little barley, and still less wheat. Turnips have been tried, and answer exceedingly well, but are very seldom sown. Potatoes are less cultivated than they ought to be. Mr Corbet

has raised immense crops of them, as well as turnips, on his new improved lands. The potatoe crops were worth 20l. *per* acre. Summer fallow is seldom practised. Clover is sometimes sown, and is found to answer amazingly well, when the land is properly prepared for it. Mr Corbet always sows parslley and white clover, which he considers to be very healthy for the cattle, on account of its diuretic quality, which prevents them from swelling.

Live Stock.—The breed of sheep in this county is the most pure of any in North Wales, and is likely to continue so, from an apprehension of the scab, foot rot, gogles and other disorders being introduced, by crossing with other breeds, which is the case in Anglesey and Caernarvonshire, but which Merionethshire is now unacquainted with. The scower is the only disorder known in this county. The breed is domesticated and very hardy, and no other attempt has been made to improve it, except sending for a ram to Tallyllyn, (at the foot of Kader Idris, the highest mountain in Merionethshire,) where the most admired and best breed in North Wales is to be found. They are much longer bodied than the common breed. Mr Corbet, one of the first improvers in North Wales, has invariably followed this plan, by which means he has improved his stock so very considerably, that he sold his wedders this year for 19s. a head, whereas the common and ordinary price given was only 13 s. for well fed wedders. The average weight is about 10 lib *per* quarter, averduois, and the average weight of a fleece, 2 lib. worth 1s. *per* lib. The wool is white, and is all manufactured into webbs and flannels in the county. The webbs sell from 14d. to 18d. *per* yard, and the flannels from 15d. to 2s. 6d. *per* yard. The practice of clipping twice a year is confined to the neighbourhood of Kader Idris, and from that to the vale of Towyn; where the sheep are clip'd in June and at Michaelmas. The summer fleece is always the largest; at Michaelmas the tail is never clip'd. The wool is left for the purpose of keeping the animal warm in the winter time.

time. Clipping twice a year is found to produce no additional quantity of wool, but those that practise it think the wool finer in quality, which however is denied by those who clip only once, as their wool sells as high as the other. In many parts of this county, the fore parts are clip'd at Michaelmas; in others, only about the neck. The sheep are always kept upon the mountains, except the ewes, which are brought down at the lambing season. They commonly produce one lamb at a birth, and the lambs are always fed in the valleys the first winter, being unable to endure the storms of frost and snow, which they would be more exposed to on the mountains, in the winter season. The lambing season is generally in March and April. The lamb is well wooled, and very lively when born. The practice of laying sheep with tar is altogether unknown in this county, nor is the want of it felt as an inconvenience, though the climate is as cold, and the storms as boisterous as in any part of Scotland. The mutton in this county is reckoned incomparably good, and is at its best at 6 years old. I have now only to take notice of a strange opinion held in this county, in regard to the feeding of sheep, viz. That pasturing them in the spring on lands that have been flooded, is apt to produce the scower. Mr Corbet assured me, and he is the only gentleman in the county that has had any experience in this way, that he never felt any bad effects from it; on the contrary, the early spring food produced by that operation, has greatly improved his stock. Part of his mountains are also flooded, from which he derives very great advantages.

Black Cattle.—The pure or native breed of black cattle are reckoned the most contemptible of any in Wales. They are small, and very ill shaped. Mr Corbet is not less remarkable for a fine breed of black cattle, than of sheep. He has brought into this county English bulls, and a great many cows of the most approved kinds, which he has found to be as hardy as the native breed, and much more profitable. He shewed me a most striking contrast between the breed of the county, and the
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the English breed ; two cows of the same age, that were reared together, the one was only worth 5*l.* or 6*l.* and the other worth 12*l.* The great attention paid to the flooding of his lands, gives him a decided superiority in point of stock, as he has spring food for his cattle, at least two months sooner than any person in the county, by which means they are always kept in good order.

Horses.—There are few horses bred in Merionethshire, and those that are reared for draught are light and weakly, consequently very ill calculated for it. Mr Corbet breeds blood, or galloping horses. His mares are thorough bred, and he has them covered by the best blood horses in England. He also breeds road, and hunting horses, of which he has a large young stock, all appearing very promising. He has built a number of paddocks, for his breeding mares, all of which are flooded and very convenient.

Swine.—The rearing of pigs is considered a very profitable business in this county, consequently a great many are bred, and fed in the same manner as in the other Welsh counties.

Goats.—Goats are by no means common, being reckoned not so profitable as sheep, and much more destructive to the plantations. For these reasons, (so much attached were the old tenants to old customs,) the proprietors were under the necessity of prohibiting them from keeping goats ; and notwithstanding a few still persist in it, often to the great detriment of their neighbours.

Implements of Husbandry.—The ploughs, carts, harrows, &c. are the same in Merionethshire, as those generally used in North Wales, and both horses and oxen are employed, and very badly managed.

Paring and Burning.—The practice of paring and burning is still common in this county, although in many places the bad effects of it are easily discerned. It is frequently done, where the soil is so thin as not to admit of it ; by which means, the land produces almost nothing. Many of the proprietors prohibit their

tenants from pursuing this method, which is highly proper, as it is often very unjudiciously done, perhaps for the sake of one good crop only.

Price of Labour.—The labourers work from 5 in the morning till 7 at night in the summer season, for a shilling; and in winter, when the days are short, for 8d. *per* day, without victuals.

Price of Provisions.—The price of provisions in this county is as low as in Caernarvonshire. The labourers and common people live chiefly upon oat meal, milk, cheese, and the produce of their gardens, where they commonly raise potatoes, cabbage, greens, &c.

Towns and Manufactures.—The towns in Merionethshire are very small. Harlech, which is situated on the sea coast, although the capital of this county, is a poor place, without trade, and remarkable only for its castle, built by Edward the first. Dolgellhen, Dinasmowthwy, and Bala, are the principal towns where webs and flannels are manufactured, which are also very general throughout the county. Besides the produce of Merionethshire, large quantities of wool are bought in Denbighshire, and wrought up here. Knit woolen stockings are also a great branch of trade. Barmouth, the only sea port, stands on an arm of the sea, whence considerable quantities of the manufactures of the county are exported. The river Avon, and many smaller rivulets, discharge themselves into it, and it is navigable for 10 miles up the country, near to Dolgellhen, where small sloops are built. Charcoal is also made in this county.

Leases.—In this county, as in those I have had already occasion to mention, no leases are granted for such a length of time as to encourage farmers to make improvements.

THE END.



GENERAL VIEW
OF THE
AGRICULTURE
OF
DENBIGHSHIRE.



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GENERAL DESCRIPTION.

THIS county, on the west, is separated from Caernarvonshire by the river Conway, except Croyddyn hundred, which belongs to that county, although on the east side of the river. On the north, for a short space, it touches upon the Irish sea, and afterwards runs parallel to the small county of Flint, in a south-eastern direction as far as the river Dee, where it is bounded by Cheshire and Shropshire; and on the south, by the counties of Montgomery and Merioneth. Its extreme length is 49 miles, its greatest breadth about 18, and near the middle it contracts to one half. It contains about 410,000 acres, divided into 9 hundreds, and 57 parishes. Although a great part of Denbighshire is rugged and mountainous, yet the lower grounds being enclosed, and in general well wooded, with a great variety of very rich valleys interspersed, considerably soften its appearance. All the country about Wrexham, (the most populous, and largest town in North Wales, lying on the eastern parts of this county) are beautifully variegated. Chirk castle, the seat of Mr Middleton, within 12 miles of Wrexham, is pleasantly situated on a rising ground, commanding a most extensive view, although surrounded with large and very valuable plantations. Wynnslay, the seat of Sir Watkins Williams Wynne, which lies half way between Chirk and Wrexham, is also a most delightful situation, with extensive old plantations; besides a number of other gentlemen's seats, all of which are encompassed with fine woods. The banks of the Dee, some parts of which are watered, afford excellent pasture and hay. The most extensive of the valleys is the celebrated vale of Clwyd, in which are a number of towns, villages and gentle-

mens seats. It is above twenty miles in length, and from three to eight miles in breadth, according to the approach or recess of the mountains, with which it is guarded on all sides, except on the north, where it discharges itself into the sea. The western parts of it are more barren, except upon the sea coast. The crops principally cultivated are, wheat, oats, barley and pease, with red and white clover and rye grass, potatoes, and a few turnip.

Soil and Climate.—There is a variety of soil in this county, consisting of gravel, clay and loam; chiefly loamy gravel, and ebb shale. The climate is reckoned moderate; wheat is commonly sown in October and November, pease in February, oats early in March, and barley in April. Harvest is reaped in August and September.

Draining.—In Denbighshire, I am sorry to say, as little attention is paid to draining, as in any other of the Welsh counties I visited. Mr Lovatt of Chirk, who is agent or factor upon some considerable estates in this county, has made great improvements in this particular, not only on the lands which he superintends, but also on the lands he farms himself, part of which is his own property, and the other part he holds by lease, which is not common in this county, nor in North Wales in general. The width of the main drains, which are left open, depends upon the nature of the soil. If boggy, from 3 to 6 feet wide at top; if otherwise, about 2 or 3 feet. The side drains are cut about 18 inches deep, and about 10 wide. Two side stones are then firmly placed and covered; after this the remaining space is filled up with small stones, until they reach within 9 inches of the surface, which are covered with shaw, fern or furze, to prevent the soil from getting to the stones; at last the original surface is replaced. If boggy land, in lieu of stones he makes use of faggots and furze. I visited his farm, and found his drains completely to answer the purposes for which they were intended; and so superior was his style of agriculture to that around him, that I could distinctly point

the different fields under his management. The reasons assigned for the general neglect of the other fields, were, the smallness of farms, and the want of leases on liberal terms.

Roads.—The turnpike roads are in much better repair than the parochial; and although the waggons run in general on narrow wheels, I found the roads in much better order than many in North Wales, where they use the broad wheels, which I have endeavoured to describe, in my survey of Montgomeryshire. The public roads are commonly 10 yards wide, raised in the middle about 12 inches, covered 9 inches thick, with a bed of stones, broken small, on which is laid screened gravel. The gentlemen in this county claim the merit, of having discovered the best method of breaking stones for the roads, which they do to the size of a swan's egg; and find them much more durable than that of a larger size, as they sooner cement. They are likewise very particular in scraping or raking the roads, by which means no water is allowed to lodge on any part of them. No trees are suffered to grow near them, and every person adjoining is compelled to clip his fence, so that the sun and wind may both have their proper influence. It is a mistaken notion, in my opinion, that prevails in many places in North Wales, (which, however, does not apply to Denbighshire) that employing people to mend the roads in winter, when the days are short, is throwing away the public money: Than which nothing can be more absurd; for it must be allowed, that it is much easier keeping, than putting in repair; therefore, instead of being profuse, money might be saved, by having labourers constantly on the roads; and I may also remark, that more attention ought to be paid in winter than in summer; the reason of which is so obvious, that it does not require to be pointed out.

Inclosures and Fences.—Excepting the mountains, *alias* commons, the greatest part of Denbighshire is inclosed, and those inclosures are of very various sizes. Almost every kind of fence is to be met with in this county. Dry stone, stone and

lime walls, hedge, ditch and hedge, dry stone wall and hedge upon the top; this last is highly esteemed. As to the hedges, some are planted with hawthorn alone, which is reckoned the most hardy and lasting; while others are composed of a variety of different plants. These parts of the commons, which might be made arable land, (of which there are very considerable tracts) would pay well, were they inclosed, and otherwise improved. The encrease of rent between enclosed land and open fields, is reckoned at $\frac{1}{3}$ upon an average; and the stock is greatly improved, by being much better kept than on commons, which never fail to be overstocked. With regard to the size and nature of the inclosures, the situation of the ground, and the nature of the soil, should be attended to; and if a common is to be divided, much depends on its extent and quality, and the number of freeholders that have interest in it. These allotments are afterwards subdivided, always according to the will of the proprietor, or the occupier of the farm. Inclosing has been found to encrease population, because the labourer and his family find constant employment in consequence of that improvement. Cottages are greatly increased since that spirit began, and labourers find constant employment in their own country, instead of being under the necessity of emigrating for their subsistence.

Wood Lands.—Denbighshire is pretty well wooded with old plantations, and I was informed, they were in general tolerably well attended to. Mr Lovett (of whose improvements I have already had occasion to take notice) prevailed upon the land owners of the estates under his direction, to take the wood lands under their own management, and appoint people, whose time is entirely taken up in securing the fences, so as not to admit a sheep, or any other animal, to get in, to browse on the trees. This precaution is of the highest importance to a young plantation. He also points out the superfluous branches, and orders them to be lopped off; and, at stated times, the woods are thinned to the best advantage. Mr Middleton of Chirk-castle has, I believe, planted more trees than any gentleman in

this county, or indeed any in North Wales. The day on which I viewed his plantations was exceedingly unfavourable, being very wet, and at times remarkably foggy. I was told, however, that they extend for many miles, and the number of acres employed in this way, I think is about 700, besides the old plantations, all of which are under the management of Mr Lovett. There is no country, I was informed, that produces better oak timber than Wales, and a great deal of it is of immense size, and very fit for present use. *But here*, as well as in other Welsh counties, planting has in general been neglected, which makes it absolutely necessary to allow those fine trees to stand, for beauty and shelter to the county, which, in time, will become of little or no value, entirely owing to the remissness of the proprietors, in this respect. In some of the counties in North Wales, I have endeavoured to point out the impropriety of so great a neglect, and I hope land owners will take the hint, by seeing it their interest.

Waste Lands.—There are no common arable lands in this county, but several commons of very considerable extent, at present depastured by the cattle and sheep belonging to the adjoining tenants. It is needless again to observe, that they are invariably overstocked and uninclosed. To particularize all the improvements that might be made upon the waste lands in Denbighshire, would be folly in me to attempt, as the climate and quality of the soil must be consulted, which was impossible for me to do, in an excursion of this kind. But from the best authority, and my own observations, I can aver, that if a division of them were to take place, a great part might be converted into arable land; and, where water can be applied, (which might be done in many instances) into rich meadows. Draining, inclosing, and planting, ought never to be neglected. The most sterile parts might also be improved; but to attempt that, whilst there were an acre of better land to cultivate, would be the highest imprudence, not to call it worse. No advantages accrue from

the present mode of commonage ; on the contrary, the balance is very commonly on the wrong side of the ledger.

Watering Lands.—Notwithstanding the very important advantages that might be derived from the flooding of lands, yet in Denbighshire, where in many places it is perfectly practicable, it is totally overlooked ; this *also* I impute to the want of leases. Mr Lovett has been at a great deal of pains to introduce watering, by procuring a man from Gloucestershire, where that practice is well understood. He floats upwards of 60 acres annually, in a very masterly manner ; and, from the very rapid improvement he has made, it is to be hoped, that it will soon become more general. His stream is the Keiriog river, one of the branches of the Dee, from which he is amply supplied. It is the opinion of Mr Lovett, and some other gentlemen in Denbighshire, with whom I had occasion to converse, that the climate is rather too cold to admit of grazing watered lands in the spring, by which means 20 s. *per* acre is lost. But I beg leave to surmise, that I got a much more favourable account of the climate in Denbighshire, than that of Merioneth ; and Mr Corbet, whom I have already mentioned, floods some hundred acres, and finds his spring grazing equal to 20 s. *per* acre ; and afterwards cuts as much hay as Mr Lovett, which is about 2 tons *per* acre. Mr Lovett cuts his hay in June, or the beginning of July ; Mr Corbet cuts in the beginning of August, after pasturing the fields to the first of June. That Mr Lovett may have more after grafs, I will not deny ; but surely spring food is so much more valuable, that every exertion ought to be made to obtain it. I am convinced, where watering is practicable, grafs can be raised in greater abundance in Denbigh than in Merionethshire, the former being more favourable for vegetation. When it has been the theme of so many useful and intelligent writers, to point out the vast variety of spring, as well as winter food for cattle, why should not this, the best, and most easily obtained, be strongly recommended ? Mr Lovett claims the merit of having introduced watering

into North Wales, but it was certainly practised long before that period, though I saw none done in so complete a manner, excepting the lands of Mr Corbet in Merionethshire.

Farms.—With regard to the farms in this county, like the generality of those in North Wales, they are too small to admit of improvements, not exceeding, upon an average, 50 acres, and occupied by tenants at will. It is the opinion of the best informed people in North Wales, that were leases granted upon liberal terms, and the farms enlarged, so as to admit of being laid out to the best advantage, and cultivated at much less expence, the exertions of the farmers could not fail soon to improve the country. Three lives, on an unimproved, and 21 years lease on an improved farm, is recommended. The farms are employed in pasture and husbandry, and the rents are very various; the highest rent that I heard of was 40s. *per acre*, (except small spots in the neighbourhood of towns, that were still higher,) and the lowest at 2s. 6d. *per acre*.

Farm Houses and Offices.—The old farm houses and offices in this county have been made without any attention either to convenience or situation; but in those built of late years, *both* have been considered, and they are kept by the landlords in good repair; but even these are still deficient in room to contain *all* the cattle, which is undoubtedly necessary for producing a greater quantity of dung. I have had so often occasion, in the course of this survey, to point out the loss a tenant may sustain from the want of a complete set of offices, and a commodious farm yard, that at present I shall forbear to say any thing farther on the subject.

Manure.—Dung and lime are the chief manures in Denbighshire, and compost dung hills are sometimes made of lime, soil, and dung. Mr Lovett takes this method of making compost dung hills; he collects the head-lands, scouring of ditches, drains and scraping of the roads, which he forms into ridges of about 4 or 5 feet high, and the same breadth in the base. It remains in that state for some months, when it is turned over;

it is then mixed with all the dung or muck he can spare, and sometime before he carries it out, he applies the proportion of about one tenth part of slacked lime to the whole of the soil and muck. It then becomes an excellent top dressing for mowing and pasture, and is sometimes applied to arable lands.

Implements of Husbandry.—The waggons run in general on narrow wheels.

The size of the chest, Length, 11 feet 2 inches.

Breadth, 3 11

Depth, 2 5

Carts and tumbrels in proportion.

The common length of the plough beams is 7 feet, with iron earth boards. The harrow, drawn by two horses, is 3 feet 6 inches high, 3 feet 6 inches broad, at one end, and 2 feet 10 inches at the other.

Very few ox teams are used. Of late, they have been introduced upon large farms, and are geared single, in the same manner as horses.

Rotation of Crops.—With respect to the rotations observed by ordinary farmers in Denbighshire, I beg leave to refer to those in Flintshire and Montgomeryshire, which are pretty similar; but shall mention a mode pursued by Mr Lovett, and a few other gentlemen in this county, that is found to answer extremely well. Supposing the land very foul of couch grass, and other weeds, it is ploughed before winter, and in the spring, and the beginning of summer, it is well wrought for turnips. About 15 tons of well reduced dung is allowed to an acre, and the turnips are sown about midsummer, which are twice hoed. They eat them with sheep upon the field, and generally begin about the middle of November; or carry them off to the cattle in the buildings; by the latter mode, an amazing quantity of dung is made. The second crop is barley, with which about 15 lib. of red clover is sown, and 2 pecks of rye grass seed, upon each acre; the third year hay; and when the after crop of grass is eaten up, about 2 tons of compost to an acre,

acre, is carried out to the field, which is sown with wheat upon one furrow. The arable parts of the farm are divided into four equal parts as near as possible, and the same routine goes on without variation. The turnips are sown broad cast, notwithstanding of which, Mr Lovett's field was as clean as a garden, and the crop very good, being at great pains to have people who properly understand hoeing. But I saw some fields, notwithstanding the favourableness of the summer, that were full of weeds; and, I am convinced, had they been sown in drill, instead of broad cast, that the crop would have been much more abundant, and the land in better condition. A great part of the soil in Denbighshire is well adapted for turnip and other green crops, which, however, are seldom cultivated. Fallowing is sometimes practised, but not so generally as it ought to be. Where it has been tried upon a stiff clayie soil, well worked and manured, it has been found to answer extremely well; but the heavy tithe, and want of leases, deter many people from attempting it.

Paring and Burning.—The practice of paring and burning was common in Denbighshire above a century ago, and was considered a very high improvement, but it is now almost entirely exploded. Mr Lovett, whose experience in the agricultural line has been very considerable, says it ought to be avoided in all places, excepting boggy, or four hide bound lands, or where there is a good depth of soil.

Labour.—An active healthy labourer, who is constantly employed, earns 1s. 4d. *per* day in the summer season, for which he works from 6 to 6: In the winter, 1s. 2d. and works from day light in the morning untill dark. If employed by piece work, he expects to earn 2s. *per* day.

Price of Corn and Provisions.

At present Wheat sells for 6s. 6d.

Barley,	-	4s	} <i>per</i> Winchesterbush:L
Oats,	-	2s. 6d.	

Butchers meat at 3½d. *per* lib. of 16 ounces.

Live Stock—It is the opinion of the best informed gentlemen in agricultural affairs, that the stock in Denbighshire might be greatly improved, by the introduction of new breeds of cattle, sheep, and horses; but very few efforts of the kind have been made. There is a great variety of breeds, and Mr Lovett thinks that the Welsh sheep might be much improved, by breeding out of the best part of the stock, and providing them with better winter keep, an article very much wanted; but I am of opinion, that the most speedy and most effectual plan would be, to cross it with fine-wooled sheep, many breeds of which are as hardy as the Welsh. The rot is the most common disease to which the sheep in Denbighshire are liable, particularly when the season proves wet. Last year, from the almost incessant rains, great numbers were carried off by it.

Towns and Manufactures.—Denbigh, the capital, is seated on a steep rock, overlooking the beautiful vale of Clwyd. It has a considerable manufacture of gloves and shoes, the greatest part of which are sent to London. On the south part of the vale, and near its head, is situated the town of Ruthin, which is very neat and populous. But Wrexham, lying on the eastern part of the country, is the largest, and contains more inhabitants, than any in North Wales. It is a place of very considerable traffic. There are besides many other towns and villages of less importance. Wool is the principal manufacture in Denbighshire. The tenants, with the assistance of their domestics, manufacture it into fine and coarse cloths, and likewise into stockings. Near the village of Chirk is a foundry for cannon, and also iron forges; and on the borders of Denbighshire are lead mines.

Fuel.—Coals are got in Denbighshire, but the common fuel used by the common people is peat.

HINTS
FOR
THE IMPROVEMENT
OF
NORTH WALES.

NOTHING, in my opinion, can retard the agricultural improvements of a country so much as the proprietors withholding leases from their tenants. As leases, either for 2 or 3 lives, or for a certain number of years, are commonly granted in all the arable parts of Scotland, it struck me very forcibly when I was informed that almost *none* were granted in North Wales, excepting from year to year, or to serve some political purpose. This circumstance I think, accounts in a great measure for the very backward state of husbandry in those districts, as no prudent man will risk his property in the improvement of another's estate, without a proper security of tenure, that he may not only have an opportunity of being reimbursed the money laid out, but also of obtaining a recompense for his exertions. This uncertainty of tenure, at all times, not only discourages, but absolutely prevents that industry and attention so necessary to improvement; and I was repeatedly told, that the tenants were afraid of making the smallest advancement in this respect, lest they should next year be subjected to a rise of rent, or be turned out of their possessions. An instance of this kind happened when I was in Flintshire. A farmer in the vicinity of Holywell, more industrious than his neighbours, had been at great pains to improve his farm, which on this account was coveted by another, who offered three or four times the present rent for it. The landlord, who perhaps would not have thought of an increase of rent, or at least not so great a rise, had it not been for this interference, could not resist this temp-

tation, and informed his tenant, that he must either remove, or pay very nearly the proffered rent. The tenant considered this treatment as extremely hard, having been considerably out of pocket in carrying on his improvements; but as he had no lease, he could not help it, and had only to regret that he had placed implicit confidence in his landlord. It may be easily believed, that a circumstance of this kind seldom occurs; because the tenants, dreading the consequences, are averse from all improvements, which is not to be wondered at from the fact stated, and which I think is incontestible, having heard it related in Holywell, and likewise in its neighbourhood. After all the landlord would not agree to grant a lease, notwithstanding the great rent offered, and as the person who proposed it, refused to have any thing to do with it without a lease, it was supposed the present tenant would still remain in the farm. This, in my opinion, evidently shows the propriety of granting leases, as they afford security to the farmer, that he may go on with spirit, in the necessary improvements, by which the proprietor is the greatest gainer in the end. I may here mention one objection stated against granting of leases, which I heard frequently made use of; that the Welsh farmers are indolent and inactive, and therefore have not the means of improvement. That they want the means of improvement is no surprise, and the reason of their slothfulness appears to me, to proceed merely from want of encouragement. As a proof of this, Lord Penryn, who has enlarged his farms and granted leases to his tenants, has doubled his rents (which no proprietor in his neighbourhood has done,) and his tenants, although Welshmen, are in as thriving a condition as any in North Wales, and in general more so. For this reason alone, were there none other to adduce, I am perfectly convinced, that the proprietors, who do not grant leases, have neither their own interest, nor the interest of their country in view. Were the farmers so reduced, as to be unable to make the smallest efforts in the way of improvement, it would no doubt be the interest
of

of the proprietor, to take one farm after another into his own hands, and, after improving it, to let it upon a lease. This method would speedily improve the country, and great advantages would accrue to the landlord. The length of time, for which a lease ought to be granted, should in my opinion depend entirely on the state of cultivation in which the farm is; because land, in an unimproved state, requires a great outlay of money, and a great many years must elapse before the farmer can enjoy the fruits of his expence and labour. He is therefore entitled to a much longer lease, than when the land is in a high state of cultivation. It is not above half a century, since the spirit for agricultural improvement commenced in Scotland, which I believe originated in East Lothian, in consequence of long leases. They were granted for 2 and 3 lives; or 2 and three nineteen years, by which means that county can boast of as improved a state of husbandry as any in England, and perhaps more so, when the nature of the soil and climate are considered. Scotland in general, soon followed the example, and since that period has made very rapid progress in the science of agriculture, and I hope soon to hear of equal improvements being made in North Wales, through the same means. The leases in Scotland are not in general filled with useless stipulations, such as liming at certain periods; observing particular rotations, &c. which is frequently the case in England. These are left entirely to the discretion of the tenant, whose interest is most deeply concerned, and who ought to be a better judge of those matters than a steward or agent, commonly bred to the law, to whom the drawing of the lease is too often entrusted, and, by inserting clauses that admit of quibble, tend to create disputes between the landlord and tenant, which could not otherwise happen. From the wetness of the seasons, it is often utterly impossible for the most skillful and diligent farmer, to put his schemes into practice, however well concerted. Therefore futile restrictions on the tenant, in re-

gard to cropping, &c. cause differences which are commonly against both landlord and tenant.

A farmer will always act according to the best of his judgement for his own interest, and that never fails to be also for the interest of the landlord, except when the lease is near about out. All that I consider necessary for the landlord in this respect is to bind the tenant to leave a certain proportion of the farm in grass; to guard against scourge crops two or three years before the expiration of the lease; to allow no dung to be carried off it, at that period; and to leave the houses, offices, and fences, in as good order as he found them. The landlord should always be left to protect his own plantations from the inroads of all animals. These I conceive to be absolutely necessary for the interest of both proprietor and farmer, because I have known it happen more than once, that farmers, having no prospect of a renewal of their lease, have begun to overcrop so soon, that they not only hurt the land, but also materially injured themselves. This however is never to be dreaded, until within 3 or 4 years of the expiry of the lease. To conclude this subject, I beg leave, for the information of some of the gentlemen in North Wales, who perhaps may not have had an opportunity of seeing it, to insert the plan of a lease, devised by the late lord Kaimes, to whom the country has been much indebted for his writings on agricultural affairs, and which I have obtained from the ingenious Dr Anderson, also justly celebrated for his writings in agriculture and various other interesting subjects.

PLAN OF A LEASE BY LORD KAIMES,

WITH

DR ANDERSON'S REMARKS.

“LEASES were invented for the purpose of giving to the farmer such a security as might induce him to become industrious from the hopes of profit, but they have never yet

“ been brought to the ultimate perfection, in practice of which
 “ this kind of tenure is susceptible. In some cases, the secu-
 “ rity the tenant enjoys under their protection is greater, and
 “ in others less; and it will be found by experience, that
 “ wherever the exertions in agriculture have been vigorous,
 “ the security the tenant enjoyed has been considerable, and
 “ wherever his tenure is precarious, they have been proportion-
 “ ally languid.

“ The æra of the commencement of agricultural improve-
 “ ments in Scotland in general, is well known to have been
 “ the year 1746*, the precise time when the heritable jurif-
 “ dictions in Scotland were abolished, in consequence of which
 “ those vague explanations of the terms of a lease which ren-
 “ dered all stipulations for the farmers protection nugatory,
 “ were entirely done away, and every thing that was indefinite
 “ was declared to be illegal, and consequently void. It was
 “ some time after this before the tenants knew how to avail
 “ themselves of this benignant and politic regulation, and so
 “ long they continued torpid and indolent; but at length gra-
 “ dually beginning to feel the sweets of that affluence which
 “ industry enabled them to acquire, their exertions, though at
 “ first feeble, by degrees acquired additional force, till of late
 “ they have, in many places, advanced with a rapidity that was
 “ unexampled in any other times.

“ An observing man who has been bred in Scotland, and
 “ who has been accustomed to take notice of what is going on
 “ around him, is astonished when he enters England, at the lan-
 “ gour and indolence that he sees almost every where there
 “ prevail in regard to agriculture, while the climate is so in-
 “ viting, the soil so fertile, and every thing he sees so favoura-

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“ ble

* “ In East Lothian in particular, improvements commenced a little before
 “ that period, in consequence of the long leases granted by Mr Cockburn of
 “ Ormiston, whose tenants set the first example of improved culture in this
 “ part of the island.”

" ble in his opinion to the wishes of the farmer. At a loss to
 " account for this phenomenon, he feels an involuntary impulse
 " to accuse the people of a vice, that I believe never yet pre-
 " vailed in any country, though it has been often imputed to
 " mankind, viz. an unnatural spirit of indolence,—a careless
 " languor,—an indifference to the pleasures and comforts of
 " life, which made them rest satisfied with fewer enjoyments
 " than were easily within their reach. It is only when he en-
 " ters into minute examinations, that he finds that the farmer's
 " industry is there taxed with a number of indefinite claims,
 " such as poors rates, tythes, and, above all, an annual tenure
 " only of his farm; which is enough to repress every generous
 " emotion within him, and sink him into the lowest range of
 " dejection*. He is then no longer at a loss to account for
 " the snail-like progress of the farmer's advances; and he bless-
 " es Heaven for having cast his lot in a country which though
 " poor is still in the train of becoming rich, because there tythes
 " are

* " I include this precarious tenure among the taxes on industry; because
 " it is very obvious, that if by means of his industrious exertions, a farmer ren-
 " ders his lands more fertile, he makes them a more tempting bargain for ano-
 " ther to offer a higher rent than they could have afforded before. The fear
 " of this must constantly repress his exertions. Nor is this the only thing he
 " has to dread. While his tenure is only for six months, as many of them are,
 " should his spirit be uncomplying with the wishes of his landlord, the conse-
 " quence is obvious. He is therefore in some measure a slave. Is it a wonder
 " if in this country, where freedom of mind is justly deemed the highest prerog-
 " ative of man, that the line of agriculture should be so universally abandon-
 " ed by men of spirit, for other employments in which they can act with great-
 " er independence? In these circumstances are we to be surprised at seeing such
 " rapid advances made in every other branch of industry, while that of agricul-
 " ture is in a great measure stationary? Had the committee of parliament, who
 " two years ago made such a discouraging report of the state of our agricul-
 " ture, considered this object in its proper light, they would have been enabled
 " to devise better measures for accelerating its progress, than those they unfor-
 " tunately adopted.

“ are definite, poor rates unknown, and the necessity of leases
“ is universally admitted †.

“ But

† “ It is a fact that must strike every one who has made the tour of Britain,
“ especially if he is acquainted with its former as well as present state, that
“ though the exertions of ENGLAND in the *mercantile* and *manufacturing* lines of
“ business, have for the last half century been vigorous almost beyond compare,
“ yet in the line of *agriculture*, it has been comparatively languid : Whereas in
“ SCOTLAND, though she started late, and has yet made but small progress in
“ industry, yet the exertions in agriculture have nearly kept pace with those
“ in the other departments. This can be ascribed to no other circumstances
“ but those mentioned in the text. Among these the drawing of tythes in
“ kind is peculiarly discouraging to agriculture, as it not only affects the
“ tenant, but even the proprietor himself, who must, on his account, forego
“ many attempts he could have made in improvements with profit. The
“ proprietors of land in the neighbourhood of Aberdeen, who justly consider
“ the expence of improving the soil as a purchase price, would in all cases
“ find that though they may have a reasonable profit, where no tythe is drawn,
“ they could have had none at all if that had been paid in kind. Indeed in
“ most cases that tythe alone is more than the whole profit they ever expect to
“ derive from it. The consequence here is obvious ; but the retardment which
“ this circumstance will make when operating in millions of cases over a whole
“ kingdom, baffles all attempt at calculation.

“ To avoid this dreaded evil, extensive tracts of land are left in England in
“ perpetual grass, when it is by no means in a condition for yielding the most
“ abundant produce in that state. The quantity of bread-corn is thus necessari-
“ ly diminished, and with it the total amount of food even for beasts is curtail-
“ ed. Nothing can be so ruinous to agriculture as those particular covenants
“ so universally adopted in England for restricting the tenant in his operations.
“ Never did the Goths or Vandals, in the rudest stage of their existence, think
“ of a device so absurd as that of restricting the exertions of farmers by rules
“ which were devised when the practice of agriculture had scarcely had a be-
“ ginning. They were indeed contrived by ignorance, and are continued by
“ villany. They are for the most part calculated to add to the power, and in
“ many cases to the emolument of the steward, at the expence of the proprietor
“ and the public.

“ Instead of thus studiously contriving to depress the tenant, a wise system
“ of policy would require that he should be guarded against every species of op-
“ pression more than any other man, because he is necessarily a more solitary
“ and defenceless animal than any other in the state. At present there is no

“ But though no man would occupy a farm in Scotland on
 “ any terms without a lease, and though no landlord there is
 “ willing to sacrifice his interest so much to his caprice as to
 “ think of obtaining *tenants at will*, they never yet have been
 “ able to devise terms for a lease that have proved perfectly sa-
 “ tisfactory either to themselves or tenants; for the interests of
 “ these two parties *seems* to be in many cases so directly oppo-
 “ site as to be irreconcilable, and they view each other with
 “ continual jealousy, so that an unceasing attempt to get the
 “ better of each other prevails, which is the source of many im-
 “ proprieties of conduct on both sides.

“ The universal aim of the tenant is to get a long lease, that
 “ he may be secured as long as possible from the landlord’s in-
 “ terfering with the profits that his industrious exertions may
 “ enable him to derive from his farm: while the aim of the
 “ landlord as universally is, to deprive the tenant of the power
 “ of ever rendering the land worse than it has at any time been
 “ brought to, and to make it devolve to him in that enriched
 “ state at as early a period as possible. He seems to forget that
 “ nature hath rendered it impossible for a man in any case, to
 “ eat his loaf and have his loaf still. If he expects profit from
 “ the labour of another, that other person must share in it.

“ The shortest period for which a spirited farmer will take
 “ a lease on any terms in Scotland is nineteen years; and
 “ though in lands that are already under good culture, and
 “ highly improved, it is very practicable for a man to make
 “ considerable exertions upon such a lease, yet, in an unim-
 “ proved farm, where expensive operations are in all cases re-
 “ quired before it can be brought to yield good crops of any
 “ kind, no man, who is not destitute of common understanding,
 “ will think of attempting these operations without a lease of
 “ much

“ line of business in which with the same capital, knowledge, and industry, a
 “ man will not live better and make more money than in agriculture: Spare
 “ him from indefinite exactions, and this would not be the case.

“ much longer endurance, so that if that be withheld, the land
 “ must continue for ever in its natural state. There are in-
 “ deed some cases where the sterility of the soil is such that
 “ scarcely any lease would afford a prudent man encourage-
 “ ment to improve them, and such fields must be left to the
 “ owner alone to improve. What tenant would ever think of
 “ laying out from fifty to an hundred pounds upon an acre of
 “ land, as has frequently been done about Aberdeen, before
 “ a crop of any kind could be put upon it? On a lease, there-
 “ fore, where improvements are required, the duration of that
 “ lease must be in some measure proportioned to the expence
 “ that must necessarily be incurred before these improvements
 “ can be effected, or they must be forever forborne. The man
 “ therefore who refuses to grant a lease on improveable land,
 “ is like him who suppresses the birth of a child; he stifles the
 “ embryo before it was called into existence; he deserves to be
 “ held in execration by all mankind as a murderer and an as-
 “ sassin. Few of the owners of land in Scotland can be accu-
 “ sed of this crime. But so sensible are proprietors, that a
 “ farm which has once been brought into culture may still be
 “ bettered, and that it always can be made worse, that they
 “ have indicated a general wish to make the lease have an in-
 “ definite termination—such as the life of the possessor or
 “ some other person. But against this kind of lease many te-
 “ nants have insuperable objections: and all of them enter in-
 “ to such a lease with reluctance, nor ever carry on improve-
 “ ments with spirit during the indefinite period. It must be
 “ owned, too, that where the lease is made to depend upon the
 “ life of the tenant himself, there is something revolting to
 “ humanity in the idea that a widow and orphans, who have
 “ just had the misfortune to lose their best support in life,
 “ should be, as it were, by that means stript of their property,
 “ and also reduced to comparative want. This plan is there-
 “ fore defective in some of the most essential requisites; for

“ equity joined with beneficence should form the basis of every
“ social contract.

“ I am extremely happy to have it in my power on this oc-
“ cation to lay before the public at large, through means of
“ the honourable board to whom this report is addressed, a
“ plan of a lease which is perfectly adapted to secure alike the
“ interest of the tenant and the legitimate rights of the land-
“ lord ; by which the rights of humanity can never be violated,
“ and which can apply to all possible cases, so that neither of
“ the parties can ever acquire an undue advantage over the o-
“ ther in any situation of things. To effect all these things
“ appeared to me for a great many years to exceed the powers
“ of human ingenuity to devise. It has been done ; and
“ the public are obliged to the late Lord Kaims for this excel-
“ lent device.

“ His Lordship proposed that the lease should extend to an
“ indefinite number of years consisting of fixed periods, at the
“ end of each of which a rise of rent should take place, with
“ permission for the tenant, at the period of each of these
“ rises of rent, to give up his farm if he shall see proper, and
“ granting a similar power to the landlord, upon proper terms,
“ to resume his land if he shall think fit. The particulars of
“ this contract, and the grounds on which they rest, are as
“ under.

“ He assumes it as a postulatum, that a landlord and tenant
“ are capable of forming a tolerably just estimate of the value
“ of the land in question for a short period of years, such as
“ it is customary to grant leases for in Scotland : say 21 years.
“ And having agreed upon these terms, which, for the present,
“ we shall call 100l. rent, the tenant expresses a wish to have
“ his lease extended to a longer period. To this the proprie-
“ tor objects, on this ground, that it is not possible to form a
“ precise estimate of what the value of the ground may be at the
“ end of that period. He has already seen that ground for
“ the last twenty-one years has increased much more in value
“ that

“ than any person at the beginning of that period could easily
 “ have conceived it would have done, and therefore he cannot
 “ think of giving it off just now for a longer period, as a simi-
 “ lar rise of value may be expected to take place in future.
 “ This reasoning appears to be well founded ; and therefore, to
 “ give the landlord a reasonable gratification, he proposes that
 “ it should be stipulated, that if the tenant should agree to give
 “ a certain rise of rent at the end of that period, suppose 20l.,
 “ the landlord should consent that the lease should run on for
 “ another period of 21 years ; unless in the cases to be after
 “ mentioned.

“ But as it may happen that this 20 l. now stipulated to be
 “ paid at so distant a period, may be more than the farmer will
 “ find he is able to pay, an option shall be given to him to resign
 “ his lease if he should find that is the case, by giving the landlord
 “ legal notice one year at least before the expiry of the lease ;
 “ but if that notice be omitted thus to be given, it shall be un-
 “ derstood that the tenant is bound to hold the lease for the se-
 “ cond 21 years, at the rent specified in the contract. And if
 “ the landlord does not give the tenant warning within one
 “ month after that period, it shall be understood that he too
 “ is bound to accept of the stipulated additional rent for the 21
 “ years that are to succeed.

“ It may however also happen, that the sum specified in the
 “ lease may be a rent considerably below the then present va-
 “ lue of the farm : or the proprietor may have very strong rea-
 “ sons for wishing to resume the possession of that land, or to
 “ obtain an adequate rent for it : a power therefore should be
 “ given to him, in either case, to resume the lands, if he should
 “ so incline. But as a great part of that present value may be
 “ owing to the exertions of the farmer, who has laid out mo-
 “ ney upon the farm, in the hopes of enjoying it for a second
 “ period of 21 years, it would be unjust to deprive him of this
 “ benefit, without giving him a valuable consideration for that
 “ improved value. On this account it should be stipulated,
 “ that

“ that in case the proprietor at this time resumes the farm, he
“ shall become bound to pay to the tenant TEN years purchase
“ of the additional rent he had agreed to pay ; which in the
“ example above stated would be 200 l.

“ But the land may be worth still more than the 20l. of rise
“ mentioned in the lease, and the tenant may be content to
“ pay more, say, 10 l. rather than remove ; and he makes offer
“ accordingly to do so. In that case the landlord should be bound
“ either to accept that additional offer, or to pay *ten* years pur-
“ chase of that also ; and so on for every other offer the tenant
“ shall make before he agrees to remove from the farm.

“ In this way the landlord is always certain, that he can ne-
“ ver be precluded from obtaining the FULL value for his
“ land, whatever circumstances may arise. And if the tenant
“ shall prove disagreeable, so that he would wish rather to put
“ another in his place upon the same terms, it never can be a-
“ ny hardship upon the landlord to pay the stipulated sum ;
“ because it would be the same thing to him as if he bought a
“ new estate at TEN years purchase free of taxes : a thing he
“ never can expect to do. It is indeed true, that it would be
“ more advantageous for him to allow the present tenant to
“ continue : and therefore this alternative will be always, un-
“ less in very extraordinary cases, accepted of, as it ever ought
“ to be ; and thus the tenant's mind is impressed with a con-
“ viction that he will continue in his possession : a conviction
“ that ought ever to prevail, because it stimulates to industry in
“ the highest degree.

“ And as the tenant is thus certain, that, at the very worst,
“ his family must be entitled to draw a reasonable remunera-
“ tion for the exertions of his industry, he can never find the
“ smallest tendency to slacken his endeavours in any way.

“ By stipulating in the original lease, in the same manner,
“ that at the end of the second 21 years the lease shall be con-
“ tinued for 21 years more ; and so on at the end of the third,

“ and fourth, and any farther numbers of periods of 21 years,
 “ on agreeing to pay a specified rise of rent ; reserving to each
 “ party the same privileges as above described, the lease might
 “ be continued to perpetuity, without either party ever being
 “ in danger of having an undue advantage over the other. The
 “ tenant will always be certain of having a preference given
 “ him over every other person, and will of course go on with
 “ unceasing exertions to better his land, which will of necessity
 “ tend to augment the income of the proprietor much more
 “ than could have happened under any other system of management.

“ Such are the outlines of that plan of a lease that his lordship
 “ has proposed. By this plan the tenant's hands are not
 “ tied up by restrictive clauses dictated by ignorance, under the
 “ pretext of securing the interest of the landlord. His interest
 “ is secured in a much more effectual manner, while the
 “ tenant is left at full liberty to avail himself of his knowledge,
 “ his skill, and his industry. Instead of ceasing to begin any
 “ arduous undertaking, as he ever must do where he has no
 “ lease ; or of beginning to improve for a few years only at the
 “ commencement of his lease, but stopping in a short while
 “ in the midst of his career, and then running it down to the
 “ same exhausted state as it was at this commencement, he
 “ continues to push forward without ever stopping ; and advances
 “ even with an accelerating progress for an endless period of years.
 “ No person but an experienced farmer can conceive the difference
 “ that would be between the productiveness of the same land under
 “ this management, at the end of a hundred years, from what it
 “ would have been if let even for detached periods of 21 years each. In
 “ unimproved waste lands, the difference would approach to infinity.
 “ In lands which were originally very rich, the difference would
 “ be less considerable ; but in all cases where cultivation could
 “ take place, the difference would be very great.

" It is worth remarking here also, that if this arrangement
 " were adopted, a new order of men in civil society would be
 " created, different from any that at present exists. They
 " would be inferior in point of rank to that class of men who
 " are called *gentlemen*, and superior in point of wealth and e-
 " nergy, not only to the present order of *farmers*, but even to
 " that class of men who are called *X-men*. The peculiar politi-
 " cal advantage attached to this order of society would be,
 " that while their exertions would always insure affluence, that
 " affluence never could become such as to permit them, by
 " imitating the life of the higher orders, to neglect their own
 " proper concerns; for the moment they did so, their exer-
 " tions in business would become slackened, in consequence
 " of which they could not afford such a rent as others around
 " them would be willing to give, and so they must quit their
 " lease.

" Here we are led to perceive the most essential difference
 " between *thus* granting what may almost be called a perpetual
 " lease, and every other *long* lease that ever yet has been tried;
 " for in all other long leases, if the rent stipulated at first shall
 " prove to be at last inadequate, and the holder of the lease be
 " reduced to poverty, by dissipation or otherwise, he may nei-
 " ther himself be able to cultivate the ground properly, nor
 " can another be permitted to do so; and by this means the
 " proprietor may not only be, for a long period of years, de-
 " prived of an adequate value for his land; but that land also,
 " being locked up from improvement, may be doomed long to
 " remain in a degree of comparative sterility. Nothing of that
 " kind could here happen. It differs also very much from that
 " sort of tenure which is called *yomanry*, in which their
 " small capital, which if properly applied, would have been
 " just sufficient to give scope to agricultural exertions, by be-
 " ing locked up on the original purchase of the land, deprives
 " the possessor of the only funds he had in his power to apply
 " for improving his land. Instead of active exertions, and
 " chearful

“ cheerful affluence through life, he is thus situated in every
“ exertion; and is doomed to a perpetual hard struggle against
“ the harassments of poverty. In short, were I either a pro-
“ prietor or a tenant, I should either let or take land upon
“ these terms in preference to any other I have ever heard of †.

“ Several little clauses have been overlooked by his lordship
“ which it would be necessary to advert to. Some provision
“ ought to be made respecting trees on a lease of this kind,—
“ as it is probable the tenant might find it convenient to plant,
“ which by the common law of Scotland, he cannot do at pre-
“ sent with a view to profit ‡. Perhaps the wood, if any was
“ on the farm at the time of his entry, ought to be valued,
“ and he should be bound to leave at least an equal value upon
“ it, or pay the balance. Whatever timber trees he himself
“ had planted, he should be at liberty to cut at pleasure, for
“ the use of the farm, unless it were such individual trees as
“ the landlord, from situation or other causes, should think
“ proper to mark for reservation. He should also have per-
“ mission to sell such trees as he inclined, unless as above re-
“ served,

“ † Those who are fond of political calculations may have here full scope
“ for their ingenuity, by supposing that two men of equal spirit, knowledge, and
“ capital set out in the agricultural line, one of them as a *farmer* on a lease of the
“ kind here proposed, and the other a small proprietor, or *Tenant*. Let the capi-
“ tal be taken any how at random, say 2000l. The *Tenant* we shall say lays out
“ 1500l. of that sum on the purchase of a farm, which at thirty years purchase,
“ the usual rate at present, would be worth 50l. a year, and he has 500l. left
“ for stocking and improving it. The other leased a farm which at a fair rent
“ was worth 200l. a year. Let him follow out the calculation, first in regard
“ to the profits that the different occupiers themselves can enjoy, and the rate
“ at which their families may afford to live, and second, with regard to the
“ augmentation of agricultural produce that each of them could afford to the
“ state; and let this be continued for the space of an hundred years. Let him
“ then strike the balance and see what an amazing difference.

“ ‡ By the law of Scotland, no tenant has a right to cut any trees upon his
“ farm.

" served, or during the last six years of any of the 21 years of
 " the lease. But in case of his removal, the proprietor should
 " either permit him to sell the whole trees that were over the
 " value of the stock at his entry, or take the whole, or such part
 " as he chose to reserve, at an appreciated value. In case of his
 " removal also, the tenant should be bound not to out-labour
 " the ground during the last six years of the lease, or to crop
 " it improperly, or to carry off any straw or dung : otherwise
 " to pay the damages that should thus accrue to the landlord
 " at the estimate of two honest men to be mutually chosen :
 " and to leave the houses in a habitable condition, and the
 " fences in good repair. There seems to be no other clause
 " necessary in such a lease.

" *Farm buildings, &c.* With regard to ordinary leases for
 " 19 or 21 years ; one of the greatest inconveniencies to which
 " tenants in Scotland at present are subjected with regard to
 " these is what respects houses. The houses are for the most
 " part very poor ; and many proprietors throw too great a
 " burthen upon the tenants. This is highly impolitic. No-
 " thing contributes more to the content and conveniency of a
 " farmer than good and well disposed buildings. It elevates
 " his mind ; gives him spirit to pursue his operations with ala-
 " crity ; and contributes in many instances to augment his
 " profits. On these accounts he ought to have them †. But
 " on no account should he be induced to expend that stock
 " upon building houses which should be employed in extend-
 " ing his own proper business. It ought always to be done by
 " the landlord ; and, in general, a good set of houses upon a
 " farm will bring a much greater additional rent than the in-
 " terest of the money expended upon them. If then a farmer
 " possessing a farm, or bargaining for one, wishes to have
 " houses, these should be built by the landlord in a good sub-
 " stantial manner, on a plan suggested, or at least approved by
 " the

† I never yet saw a thriving tenant who had not neat houses.

“ the tenant ; the tenant furnishing carriages, and paying at
 “ the rate of 5 *per cent* for the money so expended ; becoming
 “ bound to uphold the houses in good repair, during the cur-
 “ rency of the lease ; and to deliver houses to the value at least
 “ of the money expended by the landlord ; taking the tenant
 “ bound likewise to pay, along with his rent annually, the pre-
 “ mium of insurance for the value of the houses against losses
 “ by fire. Any other restrictions are unnecessary, even in this
 “ case, than those above specified respecting the last years of
 “ the lease.

“ Draining, trenching, and other expensive operations on a
“ farm that continue to be *permanent* improvements, ought al-
“ so to be done by the proprietor; the tenant who desires
“ these to be done, agreeing to pay the proprietor, during the
“ currency of his lease, by way of additional rent, at the rate
“ of five *per cent* on the money thus expended under his own
“ eye, and in the mode approved of by the proprietor. In this
“ way he would be making continual additions to his estate,
“ at the rate of twenty years purchase, *free of taxes*; and as
“ the tenant would thus also be enriched, he would be enabled
“ to adopt other spirited modes of improvement, which would
“ render it still more valuable; so that, if the plan of a lease here
“ explained were adopted, the proprietor would in many cases
“ be enabled to draw at the end of each fixed period instead of
“ five, perhaps twenty-five *per cent* for the money so advanced.
“ By making improvements somewhat on this plan, for the be-
“ hoof of his tenants, Mr Bayly of Hope near Manchester, has
“ advanced the rent of his estate in little more than twenty
“ years near ten fold!!! Operations on the same plan have
“ been carried on upon a considerable extensive scale by Mr
“ Cumming of Achry in Aberdeenshire: who has in like man-
“ ner by that means greatly increased the value of his estate.”

ROADS.

THE first and greatest object to be attended to, in the improvement

provement of a country, is good roads, as no melioration of any consequence can take place until that is effected. I am sorry to say that this is not sufficiently attended to in North Wales. The parochial roads, with very few exceptions, are in a most miserable condition; and many of the public roads are little better, particularly in the counties of Merioneth and Montgomery. In the former great exertions are now making to put them in repair, chiefly through the means of William Oakely, Esq; who had lately become a residenter in the county, and who, with the assistance of some other gentlemen, have put the turnpike act in execution. But in the latter, nothing is doing in this respect, that I could perceive. I am at a loss to account for this, unless the public funds are not properly looked after, or misapplied, as there is no want of turnpike gates, (commonly two in a stage) and the collections, I was informed, were considerable. Good turnpike roads are not all that is necessary. The parochial roads are also of very great importance, and therefore require the vigilance of the trustees. To see 3 horses employed to drag a cart, the load of which does not weigh more than 10 cwt. and a waggon containing only 30 cwt. or 40 cwt., drawn by 4 or 5 powerful horses, (as already stated in this report) surely calls aloud for reform; and I can venture to affirm, that one horse could do as much work as 4, were the roads in good repair, and made in the most level direction, which would be an immense saving. But in so wretched a state did I find many of them, (I cannot help repeating it) that I was often surprised how the carriages got along, notwithstanding the multiplicity of horses employed to so light a draught; for on horseback it frequently happened, that I could not travel 2 miles an hour, although on good roads I generally rode six. As another proof of the badness of the roads, I have to mention a circumstance that happened while I was at Welsh Pool, which, next to Wrexham, is one of the largest and most populous towns in North Wales. A gentleman arrived there, in a post chaise, on his way to Newtown, whence I had come, who asked me, What kind of roads he had to travel? I told him

they were the worst turnpike roads, for a great part of the way, I had ever seen. In consequence of this information, he immediately determined to take a pair of saddle horses, having just travelled 20 miles on a turnpike road, where he had run the risk every minute of being overset, although a great part of it was through a vale. I have been more particular in detailing these facts, because I was informed that many of the proprietors seldom visit their estates; and when they do, it is generally in the summer months, when they can have no proper conception in what state the roads are during winter. If the turnpike duty is inadequate to the expence of keeping the roads in proper repair, an additional tax ought to be laid on, which, instead of increasing the expence of carriage, would diminish it, in a most astonishing degree, which I think requires no illustration. I would also beg leave to suggest, that instead of calling on the tenants for three days annual labour of each team for the public, and as many for the parochial roads, which I understand they perform reluctantly, they should be assessed to a certain amount for each team; and I am persuaded, that this money, judiciously applied, would do three times more than is done at present, and be found less oppressive to the tenant. This practice is now become very general in Scotland, and the advantages resulting from it are very great. Formerly a farmer, in the midst of his busiest operations, was called away to the roads, by which means he sustained a loss, perhaps twenty times more than his assessment. It was always in the summer season that the statute labour was demanded, notwithstanding of which, it often became extremely inconvenient, as a farmer's labour is never at an end. By this mode, instead of employing farmers carts at all, people make a business of keeping carts and horses, for the sole purpose of supplying the roads with materials, which are broke and laid on by people bred to the business. This they do summer and winter, which prevents the roads at all times from getting into very bad repair, and thus a great deal of mo-

dulgence to allow the mail coaches to pass without paying tolls, as these carriages cut up the road perhaps more than any others now in use. The importance of good roads is such, that too much care can never be taken to prevent any improper application of the funds appropriated to their support, which I conceive this to be. But I leave this to the further consideration of such as are better judges of these matters than I can pretend to be.

OBSTACLES TO IMPROVEMENT.

I had often occasion to see lands occupied by proprietors themselves, which, from the great length of time they had been in grass, had become mossy on the surface, by which means they could not possibly be so productive as they ought. I hinted that it would be proper to plough them up, and take a few corn crops, which, by destroying the moss, would render them more fertile in grass afterwards; of this they were perfectly convinced, but the tithe deterred them, which amounts to only a mere trifle on grass fields, and for this reason, I always found, that lands in grass or pasture rented higher than those under cultivation. Were it possible to pay an equivalent in lieu of tithe, agricultural improvements would go on more briskly. Poor rates have also become a very heavy burthen; but means are devising to lessen them. There were no poor houses in North Wales, till of late. Two are now built, (very elegant spacious houses, too much so in my opinion,) and some of the other counties are proposing to follow the same plan. It has been found, that the poor are rather averse from going into those houses, especially as those that are able are required to work. Many therefore decline it, and make shift for their maintenance at their own trades at home.

SIZE OF FARMS.

THE farms are in general so small at present, that even if leases were granted, on the most liberal terms, a farmer has it not in his power to carry on his operations with economy. For instance, in the driving out of dung, or manure of any kind, a farmer who has only one cart, can never do it so frugally as one that can employ 2, 3, or 4, according to the distance it is to be driven. By this means he is enabled to keep all his people constantly employed, which cannot be done in the other case; and it will not be denied, that the sooner dung is ploughed in, the better; for, by being exposed, it soon loses a great deal of its fertilizing quality, and could these operations be carried on at the same time, it would still be more advantageous. With regard to a single plough, I may also remark, that it must be frequently unyoked, especially if the land requires to be sown as soon as it is ploughed, by which a great deal of time is lost. Nor can a small farm be cropped to that advantage that a larger one can, as it does not admit of that variety of culture and cropping which an enlightened farmer would wish to adopt. Many other arguments might be adduced in favour of large farms, were it necessary, but the hints already given, I have no doubt are sufficient.

LIVE STOCK.

I HAVE had frequently to observe, that great improvements might be made in the breeds of black cattle, sheep and horses, by the introduction of the best English breeds; yet very few attempts of the kind have been made, although those who have tried it have succeeded to their wish, excepting in Anglesey, with regard to the English ram, which I have already taken notice of, and which, in my opinion, proceeded entirely from the want of winter food, an article very much

wanted throughout all North Wales. To those who feed a few cattle on winter food, I would recommend curry-combing, which is not the practice in North Wales, but which will be found of the greatest advantage, as cattle improve much sooner by it. The method of feeding horses in the house in the summer season, upon cut grass, I would warmly recommend, because not only an immense quantity of dung might thus be made, but it will also be found by far the cheapest mode of feeding. This, however, has never been attempted in North Wales, even by people who raise clover and rye grass in abundance. Milch cows are also more profitable, by being kept constantly in the house. In the neighbourhood of London, a good cow will yield 9 English gallons *per diem*, for the first 4 months after calving; but if for 9 months, upon an average, she produces only 6 gallons, worth 6d *per* gallon, it will amount to above 40 l. *per annum*. Allowing that milk in North Wales is only worth 3d *per* gallon, still 20l. *per annum* is more by one half than was ever produced there by one cow. For the information of the Welsh gentlemen, I shall here take notice of a letter addressed to the Honourable Board of Agriculture by Baron D'alton, an Hanoverian nobleman, who says, that cows kept in the house are more profitable than when fed out of doors, but they require to be bred to it from their infancy. The best foods are clover, lucerne, potatoes, yams, turnips, cabbages, carrots, pease, beans, and honfy grass, a German grass, not known in England. This evidently shows, that the experiment has been made, and has succeeded. For my own part, I have known it frequently practised in Scotland, and it always answered, even when the animals were not accustomed to confinement from their infancy.

FARM HOUSES AND OFFICES:

ALTHOUGH I have often had occasion in the course of this survey, to take notice of the bad accommodations of the tenants, in

respect to houses, offices and farm yards, yet it appears to me of so great consequence, that I must beg leave to recommend it again to the proprietors in general, as an object well worthy of their attention. The great quantity of dung lost, from the want of proper accomodation, by this neglect, is beyond all calculation ; and *its* importance is so well known, as to make it unnecessary to comment farther upon it.

FLOODING OF LANDS.

THE watering of lands is also another matter, that requires the most serious attention. In many places, it is not very practicable, but even nature plainly points out the use which may be made of the passing stream. The number of rivers and rivulets, which occasionally overflow their banks, and which produce abundant crops of grafs wherever they run, cannot teach some people to take the hint, or to avail themselves of so fertile a manure, although it may be obtained at so small an expence *.

MANUFACTURES.

IT would in my opinion, be of great consequence to North Wales, where so great quantities of wool are manufactured, were carding and spinning mills erected ; as waterfalls are to be got in abundance. This would tend greatly to reduce the price of the article, which is the interest of every manufacturer, as it enables him to bring his goods to market at a cheaper rate. There is however only one mill of the kind in North Wales. With regard to the stockings manufactured

* I was informed, that in *one place* in North Wales, an experiment had been tried to water lands by the water of some springs, strongly impregnated with some metallic impregnation, I think copper, which did harm rather than good. But such *hurtful* mineral impregnations are very rare, and need not in general be dreaded.

factured in North Wales, it appeared to me, that the worsted thread was spun too hard. They had not the soft feel of those made in Shetland, with which I compared them, and I thought them higher priced. The Shetland stockings, which were as fine, and much softer, cost only 3s. *per* pair, and the price of those in Wales was 4s. though of the same quality or nearly so. Both were made of lambs wool.

CONCLUSION.

I could hear of no peculiar customs in any one of the counties in North Wales, that could be useful to others. The method of thatching stacks, although neat, is so tedious, and at the same time of so little consequence, that nothing more need be said upon it. There are no societies instituted for the improvement of agriculture. With regard to the names, descriptions, and address of those proprietors and farmers, who are the most active and skilful improvers in North Wales, and who are most likely to be useful correspondents to the Board of Agriculture, I have mentioned several in this report, and perhaps there may be many more, whom I had not an opportunity of seeing. I was told, that Sir Robert Vaughan, M. P. who has lately become an active improver, and whom I am very sorry to say I had not the honour of seeing, can point them out. To finish the whole, I have only to remark, that I have not seen a country so inviting as that of North Wales in general, where a farmer of industry and skill could be better situated, provided the landlords would grant proper leases. This I have no doubt will soon be the case, as many landlords were convinced of the propriety of them, from some facts which I took the liberty to state. It is my anxious wish, that the improvements suggested by the Board of Agriculture may extend to the most remote parts of the island. They are the suggestions of patriotism and of public virtue, and tend to exalt the national character and credit.

FINIS.





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R E P O R T
OF THE
C O M M I T T E E,

APPOINTED BY THE

Gr. Brit. Board of Agriculture,

TO TAKE INTO CONSIDERATION THE STATE OF THE

Waste Lands *and* Common Fields

OF THIS KINGDOM.

S455

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REPORT of the Committee appointed by
the **BOARD of AGRICULTURE**, to take
into Consideration the State of the **WASTE
LANDS and COMMON FIELDS** of this Kingdom.

INTRODUCTION.

YOUR Committee, to whom it was referred to take into consideration the present state of the Waste Lands and Common Fields of this Kingdom, and the probable means of their improvement, and to report the same to the Board of Agriculture, have proceeded in such inquiry, and are now able to state the result of their investigation, in so far as respects the Waste Lands or Commons, reserving the subject of Common Fields for a separate report.

Your Committee, for the sake of greater perspicuity, will submit what has occurred to them, regarding the present object of their inquiry, under the following heads :

- I. They will endeavour to explain the circumstances which occasioned, in ancient times, the existence of such an extent of waste lands and commons in the kingdom, and those which have hitherto prevented their improvement.
- II. They will furnish the Board with as complete and authentic a statement, as they have been able to procure, of the extent of those waste lands.
- III. They will give a short account of the different kinds of rights of common, which exist in the kingdom, and are known in law.

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They will briefly state the law, as it now stands, for the division of wastes and commons; and will point out such alterations as have been suggested, for the purpose of facilitating such divisions.

They will also state the law and practice of North Britain, in regard to the division of such lands, where a general act for inclosing commons has long been established; with the improvements which can be made therein.

- 1, They will conclude the report with some general observations on the many public advantages, and the many private benefits, to be derived from the division and improvement of such lands.
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S E C T. I.

On the Circumstances which anciently occasioned such an Extent of Waste Lands and Commons, and those which have hitherto prevented their Improvement.

IN tracing the circumstances which anciently occasioned such an extent of Waste Lands and commons in the kingdom, and those which have hitherto prevented their improvement, the inquiries of your committee were much facilitated, by the information they found, not only in the reports transmitted to the Board on the agricultural state of the kingdom *, but also in the writings of several intelligent authors who have incidentally entered into that subject †. It would appear, from the information with which your committee was thus furnished, that England was anciently divided into districts, known under the name of *manors*, the extent and value of which were extremely various. That a certain portion of each manor, under the name of *demesne lands*, was in general possessed by the proprietor or lord, and was cultivated for his behoof by his slaves or servants, assisted by the personal services of the neighbouring tenants. That a second portion, under the name of *common fields* and *meadows*, was occupied by the tenants of the manor, who kept part of it in hay for the win-

* See, in particular, the Agricultural Account of Wilts, p. 15.

† Blackstone's Commentaries, Vol. II. p. 90.—Marshal's Rural Economy of Yorkshire, Vol. I. p. 48.—Remarks upon the History of the Landed and Commercial Policy of England, Vol. I. p. 133.—and the Elements of Commerce and Theory of Taxes, by Dean Tucker; a work which the author printed, and distributed among his friends, but never published, though a most valuable performance.

ter provision of their cattle, and who cultivated the rest for grain. The remainder was called the *lord's waste*, and being considered of little value, was appropriated for supplying the inhabitants of the manor with wood, (for the purpose of building or repairing their houses, constructing implements of husbandry, fuel, &c.) also with turf and with herbage; where, in tolerable seasons, the cattle, sheep, and horses of the lord and of his tenants, found the means of subsistence. The first portion was held in severalty, and even at an early period was often inclosed, to prevent the incroachments of the tenants in the neighbourhood. The second, whilst the crop was upon the ground, whether meadow-grass or grain, belonged exclusively to the persons by whom it was respectively occupied; but no sooner was the crop secure, than it reverted into a state of commonage. The third division always remained in common, subject to a variety of regulations, according to the customs established in the different manors, according as the common was stinted or unstinted, or whether more than one manor or township happened to be interested in the same waste. Such were the circumstances, joined to the scanty population and defective agriculture of the country, which occasioned the greater part of the waste lands in the kingdom; to which is to be added, the vast tracts appropriated to the use of the sovereign, in various parts of the kingdom, under the general name of *forests* or *chases*, where he might enjoy the great source of amusement in those days, the diversion of hunting and hawking, without disturbance or encroachment.

The idea of having lands in common, it has been justly remarked, is to be derived from that barbarous state of society*, when men were strangers to any higher occupation

* It is remarked in the county Reports, that those who live in the neighbourhood of great wastes, are still an idle and lawless set of people, Brecknock Report. p. 40 & 42. Radnor Report. p. 16. That such commons are the frequent resort of thieves and other depredators on the public. Lincolnshire Report. p. 23. and on that account, but particularly near the capital, a public nuisance. Foote's Middlesex. p. 30.

than those of hunters or shepherds, or had only just tasted the advantages to be reaped from the cultivation of the earth. But when once such a mode of occupying property in land, as even the one above described, however disadvantageous, is established by long custom, it is extremely difficult to bring about an alteration, more especially if there are any circumstances which lead any number of individuals of the society to imagine, that it is for their own private interest to support the existence of such a custom, or if there are any obstacles, which render the means of altering that system of occupancy, either troublesome or expensive.

This leads your committee to state to the Board, the objections which have been made to the improvement of waste lands, and the obstacles which have hitherto prevented their cultivation.

In the first place it has been urged, that the improvement of wastes has a tendency to depopulate the country, by diminishing the number of cottagers, who, from the profits they derive from such wastes, are enabled to reside in their neighbourhood, but who must be driven from it were the wastes inclosed. Such an idea, however, is evidently contrary to reason and common sense. It is impossible to suppose that the poor should be injured by that circumstance, which secures to them a good market for their labour (in which the real riches of a cottager consists) which furnishes them with the means of constant employment, and by which the farmer is enabled to pay them better wages than before. If a general bill also for the improvement of waste lands were passed, care must be taken that the rights of the poor should be fully as much attended to, and as well protected, as those of the rich. As inclosures will, it is to be hoped, in future be made at much less expence than heretofore, the poor evidently stand a better chance than ever of having their full share undiminished. Some regulations also may be thought of, which may secure the accommodations they may have occasion for, by enlarging, where circumstances will admit of it, the gardens annexed to their respective cottages, giving them

them a decided preference with respect to locality over the larger rights, throwing the burden of ring-fences upon the larger commoners, and where it is necessary, having a certain portion of the common allotted, for the special purpose of providing them with fuel; and here it may be remarked, that a small portion of ground, planted with furze or quick growing wood, might, under proper regulations, be as productive of fuel as ten times the space where no order or regularity is observed. If by such means the interests of the poor were properly attended to, if their rights are preserved, or an ample compensation given for them, it is impossible that any legislature can hesitate, about bringing into culture so large a portion of its territory, merely because it might not accord with the prejudices or imaginary interests of any description of persons, whose objections evidently originate from the apprehension, rather than the certainty, of injury.

In the second place it is said, that commons are an excellent nursery for rearing young cattle, and consequently ought to be preserved. No idea however can possibly be more absurd. If any person will take the trouble of comparing the stock on any common, with those to be found in the neighbouring inclosures, they will soon be satisfied of the contrary. That commons are well calculated for stunting the growth, or rather starving animals of every description, those who pasture their stock upon them, have in general experienced.—Where the right of common is *unlimited*, as Dean Tucker justly observes, the ground is so over-stocked with numbers, that no large sized or generous animal can be bred upon it, and even where the right is *limited*, frauds are so very easily and frequently committed, that it amounts, in the event, to the same thing as if there had been no limitation at all *. In regard to rearing lambs, colts,

* Indeed where no person is particularly called upon to watch and detect the fraud, and where every one may hope to be winked at in his turn, it is ridiculous to suppose that a very strict enquiry will be made.
For

colts, or calves, it is apprehended, that grounds free from disease, and inclosures properly watered and sheltered, can rear them as well; and afford grass as good and plentiful, as wild barren commons over-run with heath, furze, fern, or brush-wood.

The only remaining objections, entitled to the consideration of the Board, are, the heavy charges and other difficulties attending the division of wastes and commons, and, even after they are divided, the expence necessary for their improvement, which does not always repay the proprietor the charges which it costs him.

These are, in fact, the only obstacles which prevent the public from speedily receiving, all the extensive and various benefits which may be expected from the cultivation of our waste lands; and, fortunately, these are obstacles, which it is to be hoped will be speedily removed by the exertions of the Board of Agriculture. In regard to the expence and difficulty attending the division of wastes and commons, which are so great, that where the common is small, the expence of obtaining an act, particularly if contested, would do more than improve the land in question, there is every reason to imagine, that a wise legislature will remove every obstacle of that nature, when once the many important advantages, to be derived from facilitating the division of wastes, are pointed out, and the means of doing it are ascertained; and in regard to the second, it is to be observed, that the proprietors of such wastes will, in future, have their share allotted to them at a very inconsiderable expence, so that the money they are able to lay out, instead of being exhausted in procuring a division, will be expended on the improvement of the soil, and in many cases will be sufficient for that purpose. There will then be little risk, of the proprietor wanting a sufficient return for the capital expended. Be-

For who will take upon him the odious character of an *informers* against his neighbours? and why should this man be so very busy more than another? This is the language, and these are the sentiments, however absurdly it matters not, that will always prevail on such occasions.

fides,

sides, when the Board of Agriculture has collected into one focus, the result of the experience of the whole kingdom, in regard to the best mode of rendering waste lands productive, such improvements will be no longer a matter of doubt, nor the means of effecting them uncertain. The proprietors of such wastes will be no longer under the necessity of discovering, by means of expensive experiments, the best means of improving their property, but they will at once be able to determine, how to render any portion of waste, to the exclusive possession of which they are found to be entitled, productive and valuable.

At present, a right of common, unless the right is stinted or kept under the best system of regulations, is seldom of much advantage to those who enjoy it. From the Westmorland report it appears, on the most unquestionable authority, that the liberty of keeping ten sheep for a whole year, may be hired for six-pence, and as it is supposed to require six acres to maintain that number of sheep, the rent of such land, therefore, is only a penny an acre, and the price of the fee-simple of it, at twenty-four years purchase, two shillings *. In Wales, where the commons are probably better, four-pence *per head, per annum*, is the rate of keeping a sheep on such ground, and other cattle in proportion.† In many parts of the kingdom however, it would appear from several of the reports transmitted to the Board, that many decline availing themselves of such a privilege, finding that it does not, on a fair calculation, pay even common interest for the capital employed ‡.

* See the Bishop of Llandaff's Preliminary Observations to the Westmorland Report, p. 8. The learned and respectable Prelate justly adds, " That whilst there is an acre of such waste improveable land " in Great Britain, it may be hoped, that when the legislature shall " turn its attention to the subject, no inhabitant of this island will be " driven by distress to seek a subsistence in Africa or America."

† North Wales Survey, County of Flint. p. 3.

‡ See Devon Report, p. 52 and 53. Lincoln Report, p. 28. Baird's Middlesex, p. 23. and particularly Radnor Report, p. 25. and Wilts Report, p. 136.

The following case, puts in the strongest point of view, how that even a loss may be sustained by commonage. Let one man put a cow of any value upon a common, who has a right to do so for nothing any time in spring, and let another give a farmer 1s. 6d. a week for the keep of his cow in an inclosure, both being of the same value when first turned out; if both are driven to market at Michaelmas, the difference of price will do more than re-pay the expence of the keep, without making any allowance for the additional quantity of milk which the cow, kept in an inclosure, must yield.* In regard to sheep, if they are of a valuable sort, the profit of hiring land almost at any rent, instead of putting them on a common for nothing, is still greater†. And the enormous losses sustained by that species of stock, when the rot, or any infectious disorder gets into a neglected flock, can hardly be calculated. Can there then be stronger arguments, in favour of giving every possible assistance and facility to the improvement of our waste lands, which at present, are, in many cases, a real loss to the community, and a prejudice to those who might be supposed to derive some benefit from them, but which, if improved, might add millions to the national wealth, and furnish the means of occupation and subsistence to millions of additional subjects.

* By some it is asserted, that if a cottager purchases a cow in spring, and keeps it upon a common during the best season of the year, and afterwards sells it at Michaelmas, that the difference of the price runs away with all the profit that could be got from the milk, &c. Even in stinted pastures, which are likely to be the most profitable, the advantages are very inconsiderable, and nothing in comparison to those which the same lands would produce under a proper system of cultivation.

† See Leicester Report, p. 57.

S E C T. II.

On the Extent and Value of the WASTE LANDS in the Kingdom.

IT would certainly have been extremely desirable, had it been in the power of your Committee, to have furnished the Board with an exact statement of the extent of Waste Lands in the kingdom: that, however, could not be effected, without an expence to which the funds of the Board were totally inadequate. It is a subject, however, which may be well entitled to the consideration of Parliament, whether a survey of them ought not to be made, either at the public expence, or at the charge of those, to whom the property of such wastes belong. In the interim, a *general*, though not an accurate idea of their magnitude and extent, will be given in the following statement, partly founded on the Reports transmitted to the Board by its different surveyors, partly on calculations made from the county maps, where they have distinguished the waste from the cultivated land, and partly, where both these sources of information failed, from such other means of ascertaining their extent, as your Committee could have access to.

It may be necessary, however, to premise, that under the general name of Waste Lands, your Committee comprehend not only commons, where there is an intermixture of property, but also such lands as lie open, uninclosed, and uncultivated, yielding nothing but coarse and common herbage, heath, furze, and other productions of little value, though no right of common has ever been exercised thereon. It was impossible for your Committee to distinguish the one from the other; and they naturally imagined, that the Board might wish to form, as early as possible, some general idea of the total extent of the unproductive lands in the kingdom, reserving it for future inquiry to ascertain the distinctions between them.

GENERAL.

GENERAL VIEW of the AMOUNT of WASTE LANDS in the Kingdom of GREAT BRITAIN.

I. ENGLAND.

County.	Statement, on what founded.	Distinction of Lands.	Number of Acres.
* Bedford - - - -	County Report, p. 11.	Commons and Waste Lands -	108,500
Berks - - - - -	Ditto, p. 59. - - - -	Forest and Commons - - - -	40,000
Bucks - - - - -	Ditto, p. 32. - - - -	Wastes - - - - -	6,000
Cambridge - - - -	Ditto, p. 193. - - - -	Wastes and Commons - - - -	185,300
Chester - - - - -	Ditto, p. 8. - - - -	{ Wastes, including Peat } { Bogs and Mosses - - - }	60,000
Cornwall - - - - -	Ditto, p. 56 and 57. -	{ Wastes, including Furze } { Crofts, &c. - - - - }	505,656
Cumberland - - - -	Ditto, p. 34. - - - -	Wastes and Commons - - - -	492,000
Derby - - - - -	Ditto, p. 38. - - - -	{ Wastes, &c. not employed } { in Husbandry, 1-3d of } { the County - - - - }	239,492
Devon - - - - -	Ditto, p. 65. - - - -	{ Waste Lands, 1-5th of } { the County - - - - }	320,000
Dorset - - - - -	Ditto, p. 5. - - - -	Waste Lands - - - - -	86,000
Durham - - - - -	Ditto, p. 43. - - - -	Waste Lands, about - - - -	130,000
Essex - - - - -	{ Calculated from the } { County Map - - - }	Waste Lands and Forests - -	27,693
Gloucester - - - -	County Map - - - - -	Wastes and Forests - - - -	28,500
Hants - - - - -	{ County Report, p. } { 32, 35, 41, 43. - - }	Waste Lands and Forests - -	188,650
Hereford - - - - -	County Report, p. 27. -	Waste Lands - - - - -	20,000
Herts - - - - -	County Report - - - -	Wastes - - - - -	4,500
Hunts - - - - -	General Information - -	Wastes, including Fens - - -	20,700
Kent - - - - -	County Map - - - - -	Wastes and Commons - - - -	12,220
Carry over - - - - -			2,475,211

* The Commons, Fields and Meadows, the Commons and Waste Lands, of the County of Bedford, are

ENGLAND—continued.

County.	Statement, on what founded.	Distinction of Lands.	Number of Acres.	
		Brought over - - -	2,475,211	
Lancaster * - - -	County Report, p. 52. -	Wastes, Moors, and Marshes -	108,500	
Leicester - - - -	County Report, p. 46. -	Waste Lands - - - - -	20,000	
Lincoln - - - -	County Report, p. 112. -	{ Commons, Wastes, and } unembanked Salt Marshes }	200,000	
Middlesex - - - -	{ Calculated from the } County Map - - - }	Commons and Heath - - - -	13,080	
Monmouth - - - -	General Information - -	1-4th Waste - - - - -	67,520	
Norfolk - - - -	County Report, p. 5 & 13. -	Wastes, including Warrens -	143,346	
Northampton - -	General Information - -	Commons and Fens - - - -	45,000	
Northumberland	County Report, p. 7. - -	{ Wastes and Mountain- } ous Districts - - - }	450,000	
Notts - - - - -	{ Calculated from the } County Map - - - }	Waste Lands and Forests - -	67,880	
Oxford - - - - -	Ditto - - - - -	Wastes and Commons - - - -	37,880	
Rutland - - - -	County Report - - - -	{ Unclosed Land, 1-3d } of the County - - - }	50,000	
Salop - - - - -	From the County Map -	Wastes and Commons - - - -	131,612	
Somerset - - - -	County Report, p. 22. -	{ Wastes and Commons, } Fens included - - - }	100,000	
Stafford - - - -	County Report, p. 22. -	Waste Lands, &c. - - - -	141,760	
Suffolk - - - - -	County Report, p. 19. -	Waste Lands - - - - -	100,000	
Surrey - - - - -	County Report, p. 25. -	Commons and Wastes - - - -	96,000	
Sussex - - - - -	County Report, p. 95. -	Wastes and Commons - - - -	90,000	
Warwick - - - -	County Report, p. 37. -	Wastes and Commons - - - -	120,000	
Westmorland - -	County Report, p. 6. - -	{ 3-4ths of the County un- } cultivated Land - - - }	405,120	
Wilts - - - - -	General Information - -	Wastes and Downs - - - -	200,000	
Worcester - - -	County Report, p. 17. -	Waste Lands - - - - -	15,000	
York {	East Riding	General Information - -	Wastes and Commons - - -	254,588
	West Riding	County Report, p. 140. -	Wastes and Commons - - -	405,170
	North Ditto	Ditto - - - - ditto - -	Wastes and Commons - - -	442,000
Total Wastes and Commons in ENGLAND - - -			6,259,670	

* The Quantity of Waste Land in the printed Copy of the Report of Lancashire, ought to be altered

II. *W A L E S.*

County.	Statement, on what founded.	Distinction of Lands.	Number of Acres.
Anglesea - - - -	County Report - - - - -	Wastes and Commons - - - -	5,000
Brecknock - - - -	County Report, p. 39. -	Wastes and Commons - - - -	256,000
Cardigan - - - -	County Report, p. 30. -	Wastes and Commons - - - -	206,720
Carmarthen - - - -	County Report, p. 21. -	Wastes and Commons - - - -	170,666
Carnarvon - - - -	General Information - - -	1-3d of the County Waste -	102,333
Denbigh - - - -	General Information - - -	1-4th of the County Waste -	102,500
Flint - - - - -	General Information - - -	1-4th Waste - - - - -	40,000
Glamorgan - - - -	General Information - - -	1-4th Waste - - - - -	107,200
Merionethshire - -	General Information - - -	1-3d Waste - - - - -	166,666
Montgomery - - - -	County Report, p. 12. -	Wastes and Commons - - - -	250,000
Pembroke - - - -	County Report, p. 21. -	Wastes and Commons - - - -	22,222
Radnor - - - - -	County Report, p. 16. -	Wastes and Commons - - - -	200,000
Total in WALES - - -			1,629,307

III. SCOTLAND.

County.	Statement, on what founded.	Distinction of Lands.	Number of Acres.
Aberdeen - - - -	County Report, p. 127.	Unimproved Land - - - - -	374,400
Argyle - - - -	General Information - - -	{ Wastes and Mountainous Districts - - - - - }	787,733
Ayr - - - - -	General Information - -	Moorish Waste - - - - -	218,454
Banff - - - - -	General Information - -	Wastes and Hills - - - - -	290,000
Berwick - - - -	County Report, p. 10.	Moor, Moss, &c. - - - - -	126,000
Bute, and the rest of the Hebrides * - - }	Hebrides Report, p. 60.	Moors, Wastes, &c. - - - -	2,880,000
Caithness - - - -	County Report - - - - -	Wastes and Commons - - -	368,000
Clydesdale - - -	County Report, p. 71.	Moors, &c. - - - - -	250,000
Clackmannan - - -	General Information - -	Wastes and Moors - - - - -	25,000
Dumbarton - - -	General Information - -	Wastes - - - - -	164,266
Dumfries - - - -	General Information - -	Wastes and Commons - - -	200,000
Elgin - - - - -	General Information - -	Wastes and Commons - - -	350,000
Fife - - - - -	County Report, p. 1.	Hill, Moss, &c. - - - - -	64,000
Forfar - - - - -	County Report, p. 1.	Wastes, in English Acres - -	71,875
Inverness - - - -	General Information - -	5-6ths Waste - - - - -	1,694,933
Kinross - - - - -	General Information - -	Wastes - - - - -	25,000
Kirkcudbright - -	Galloway Report, p. 1.	2-3ds Waste, in English Acres	366,734
East } - - - -	General Information - -	Wastes - - - - -	55,000
West } Lothian -	County Report, p. 5.	Wastes, in English Acres - -	14,336
Mid } - - - -	County Report, p. 7.	1-3d Waste - - - - -	76,800
Mearns - - - - -	General Information - -	Wastes and Commons - - -	164,266
Nairn - - - - -	General Information - -	Wastes and Commons - - -	10,000
Orkney - - - - -	General Information - -	Wastes and Commons - - -	700,000
Perth - - - - -	General Information - -	5-6ths Waste - - - - -	1,321,600
Renfrew - - - - -	General Information - -	1-6th Waste - - - - -	24,533
Ross and Cro- martie } - - - -	General Information - -	5-6ths Waste - - - - -	1,460,000
Roxburgh - - - -	County Report, p. 58.	Heath and Hill Pasture - - -	250,000
Selkirk - - - - -	County Report, p. 15.	Ditto, in English Acres - - -	145,000
Stirling - - - - -	General Information - -	Wastes and Commons - - -	125,000
Sutherland - - - -	General Information - -	5-6ths Waste - - - - -	1,232,000
Tweeddale - - - -	County Report, p. 1.	Wastes, in English Acres - -	169,360
Wigton - - - - -	Galloway Report, p. 1.	Moorlands, in English Acres -	195,934
Total in SCOTLAND - - -			14,218,224

* Exclusive of 1,000 Square Miles, or 640,000 Acres, of Rock and Sand.

The following will then be the total amount of Waste Lands in the united kingdom.

	Acres.
In England - - - - -	6,259,470
Wales - - - - -	1,629,307
Scotland - - - - -	14,218,224
Total -	22,107,001

The above estimate is to be considered as drawn up merely for the purpose of giving the Board *some general idea* of the magnitude of this great source of future national wealth. The proportion of the waste to the cultivated lands, it may also be proper to observe, is very considerable. —The whole island of Great Britain is supposed to contain, only about 49,436,160 acres, of which there is too much reason to believe that no less a quantity than 22 millions remains uncultivated.—What a difference would it not make in the state and prosperity of this island, were only one half of these extensive wastes, in the words of one of the Reports*, “to wave with luxuriant crops of grain—“be covered with innumerable herds and flocks—or “clothed with stately timber †!”

Of the value of these wastes, were they improved in the manner of which they are capable, it is difficult to form any estimate:

* Westmorland Survey, p. 53.

† There is a circumstance also, of which it may not be improper to take notice in this place. The Waste Lands above enumerated are not only uncultivated themselves, but they have a tendency to make the farmers in the neighbourhood to neglect the improvement of the lands they enjoy in severalty (a). The dung of the stock kept on the waste, unless where the system of sheep-folding is adopted, is evidently lost, and when once a person learns to become careless of one article, the same spirit

(a) Brecon Rep. p. 39.

estimate. At the same time it may be of service to submit to the Board some data, as the basis of future calculation. On the supposition, therefore, that there are 22 millions of acres of waste lands in the kingdom, the whole may be divided, according to the various qualities of the soil and surface, in the following manner :

	N ^o of Acres.
Lands incapable of all improvement	- 1,000,000
Lands fit to be planted	- - - 3,000,000
Lands fit for upland pasture	- - - 14,000,000
Lands fit for tillage	- - - 3,000,000
Lands capable of being converted into meadow, or water meadow	- - 1,000,000
Total	- <u>22,000,000</u>

The million of acres stated as being incapable of cultivation must be estimated as of no annual value.

The three millions of acres supposed to be fit for plantation, according to the ingenious calculation of the Bishop of Llandaff, may be made worth 8*s.* per acre, or, in all,

of inattention soon spreads to others of perhaps greater importance ; and so infinitely superior does land appear, when cultivated even in the most slovenly manner, compared to the adjoining waste or common, that there is but little call for exertion. After making such a comparison, the husbandman is too apt to sit down completely satisfied with the wonderful progress he has already made, though he has reached, perhaps, only the first stage of improvement. Besides, there is here every encouragement to idleness. A farmer, thus situated, naturally depends upon the imaginary profits to be derived from the adjoining commons, for the summer sustenance of his stock, an advantage which he enjoys *gratis*, and thence he flatters himself that he can subsist without the drudgery of hard labour, to which the proper cultivation of his farm would unavoidably subject him. Such circumstances as these, operating in a greater or lesser degree along the margins of all our wastes, and affecting the cultivation of the inclosed land in their neighbourhood, must, on the whole, be productive of very considerable national loss.

£. 1,200,000

£.1,200,000 per annum *. This, however, is the value of the annual produce, and not rent.

The fourteen millions of acres. of upland pasture, when improved, cannot be calculated at less than 5s. per acre of rent, or £.3,500,000 per annum.

The three millions of acres, supposed to be convertible into arable land, would certainly, when inclosed, be worth, at an average, 10s. per acre, or £.1,500,000 per annum.

The million of acres, supposed to be converted into meadow, or water meadow, cannot be calculated at less than £.1. 10s. per acre, or £.1,500,000 in all.

The account may then be thus stated :

Rent of the upland pasture	- - -	£. 3,500,000
Rent of the arable land	- - -	1,500,000
Rent of the meadows	- - -	1,500,000

This must be multiplied by 3, in order to give the annual produce - - -

19,500,000

Add the annual produce of the three millions of acres, supposed to be planted, amounting to - - -

Total - £.20,700,000

* See Preliminary Observations to the Survey of Westmorland, p. 10. The Bishop calculates, that a barren estate, consisting of 1,000 acres, though placed in a high and bleak situation, may be improved by plantation, from £.4. 3s. 4d. to £.400 per annum, or 8s. per acre, reckoning the value of a reversion as a present certainty, and stating the interest of money only at £.4 per cent. In other places, however, more favourable to the growth of trees, the profit is estimated much higher. In the Hampshire Report in particular, p. 30, it is stated by two very experienced nurserymen, that even poor land, when planted, will produce, at the end of 25 years, at least £.100 of value in timber and firewood.—In Scotland, Dr. Robertson states the profit at 6s. per acre. Perth Report, p. 107. The Bishop seems to have hit on a just and proper medium, applicable as an average to the whole kingdom.

In a former part of this Report (see p. 8.) it has been stated, that in many instances waste lands and commons are let even for 1 *d.* per acre; and in others, that persons do not think it worth their while to avail themselves of the privilege of sending stock to pasture on them, and that it is a right often attended with loss, instead of benefit. At the same time these wastes must produce something; and in the case of downs, when under a proper system of folding, are of service even to the arable land. Having calculated, however, the improved produce under 20 *s.* per acre, if we estimate the present value at one-tenth of that sum, or 2 *s.* per acre, as the average of the whole kingdom, amounting in all to £. 2,100,000, for 21 millions of acres, it is probably as high as that produce is really worth, more especially collected as it is from extensive and uncultivated wastes, under every possible disadvantage.

These calculations, however imperfect, will, it is hoped, furnish the Board with some idea of the magnitude of this object in a national point of view, and when to that is to be added the great advantages to be derived from the improvement of land, at present under a defective system of cultivation, it is difficult to hazard the naming of any sum, for the total additional income which the people of this island may derive from agricultural improvements, without being suspected of exaggeration, at least by those, who, unaccustomed to trace the effects of industry and exertion, except in small districts, cannot at once enter into the spirit and justness of calculations, which include in them all the possible improvements of which an extensive kingdom is capable.

It certainly, however, would be in the highest degree imprudent, to act as if the resources above stated were already in our possession, or immediately within our reach. Such an addition to the annual income of the people, as the sum above hinted at, to be obtained even from our wastes alone, cannot be secured without great industry, considerable exertion, some time, and much expence*. It is, at
the

* The expence of improving these wastes must be considerable, but at the same time does not properly come within the purview of this Report, as that expence is defrayed, not by the public, but by individuals.

the same time some consolation, to have the prospect of such an addition to the national capital and income opened to our view, as it must tend to alleviate the burden of those debts and taxes to which this country is already subject, or may in future be liable.

duals, who dedicate their labour and capital to that object. As well might we deduct, in estimating the value of foreign commerce, the expence of the ships, provisions, &c. and even of the fleets necessary for its protection.

SECT. III.

Of the different Sorts of Rights of Common, known to, or acknowledged by, the Laws of ENGLAND.

IT seems unnecessary to your Committee, to enter much at length into a definition of the different rights of common, at present known to, or acknowledged by, the laws of England; because they trust and hope, that by a division of all wastes and commons, every right of that description will be extinguished. At the same time it may not be improper, shortly to state the nature of such a right in general, and the various distinctions of which it has been found susceptible.

Your Committee find, that a right of common is, in general, understood to be, *a profit which one person hath in another's land, without having any property in the soil.* It is an incorporeal right out of or by some grant, as originally commencing in some real or supposed agreement between lords and tenants, or incident to some tenure for valuable purposes.

Your Committee find this right of common divided, according to the subject matter, as follows :

1. Into *Common of Pasture* ; which is a right of taking the produce of land by the mouths of the cattle.
2. *Common of Turbary* ; or the right of cutting turves (turf) for fuel.
3. *Common of Estovers* ; or the right of cutting wood, for fuel, for the repairs of the house, implements of husbandry, or of hedges and fences. And,
4. *Common of Piscary* ; or the liberty of fishing in another's water—the consideration of which your Committee judge foreign to the object of their inquiries*.

The material variation between the different rights above stated, consist in the subject matter—Common of pasture, being a right of feeding on the verdure and herbage of the

* In some parts of England also there is a *common of foruling*, or a privilege of killing wild fowl, and a *right of falcage*, by which is meant the right of cutting hay in a common meadow, according to the custom of the manor.

soil; but, common of turbary, conveys a right of carrying away the very soil, or the produce of the soil itself: In other respects they resemble each other; so that your Committee find it necessary to be particular in these illustrations of the right of common of pasture only.

Common of pasture, they find divided, technically, as follows:

1. Common appendant.
2. Common appurtenant.
3. Common in gross. And
4. Common because of vicinage.

Common appendant, is incident of common right to all who hold land parcel of a manor, and is a right to depasture their commonable cattle (such as horses, oxen, cows, and sheep) which are necessary either for the cultivation or manurance of their lands, and levant and couchant thereon, upon the wastes of the manor.

It must have had its origin before time of legal memory, for at this day no such right can be created: As where the lord of a manor, before the statute of *quia emptores*, enfeoffed another of lands parcel of the manor, the feoffee became entitled to common, for his commonable cattle, levant and couchant on the lands granted, within the wastes of the lord, as incident to the feoffment.

The soil of the land subject to this species of right is in the lord of the manor; and thus the lord and his tenant have a mixt enjoyment of the property; and it is laid down to have originally belonged to arable land only, though now it may be claimed as belonging to meadow or pasture.

Common appurtenant, is a right belonging and appertaining to land, but not incident to any tenure. It must have its commencement by grant, and therefore may be (though no modern instance has occurred to your Committee) erected at this day. As where a man bargains and sells land to another, and grants therewith a right of common over certain of the bargainor's lands, this right shall be held as appurtenant to the lands sold.

From the nature of its origin it may extend to every species of cattle, such as swine, and also to geese. It may be limited to a certain number of cattle; or it may extend to

all cattle sans nombre: but it is apprehended, that such a right cannot be extended beyond that number which the land to which the common is appurtenant can maintain throughout the year; or, in other words, they must be levant and couchant thereon.

Common in gross, is where common appurtenant to lands has been alienated, and is held separate from the lands to which the common was appurtenant, and differs not from common appurtenant in any other particular, than by what necessarily attends such disannexation; viz. in its descendible quality through the same invariable line of descent from ancestor to heir, and not as an accessory to land. And from hence arises the distinction in the mode of claiming common appurtenant or in gross; the former claimant, stating his title to arise from an immemorial usage by all antecedent owners and tenants of the land to which the common is appurtenant; and the latter claimant, in himself and his ancestors for time immemorial.

Common because of vicinage, is not properly a right, but is merely an excuse for a trespass; and is where two or more towns have common in the fields within their townships, which are open to the fields of the neighbouring townships. The cattle put to use their common, have been immemorially used to escape into the fields of the neighbouring towns, and therefore by inclosure of the fields of one or more townships the common because of vicinage may be extinguished.

All these species of rights of common, except where a particular grant can be shewn, must be prescribed for and proved by long and immemorial usage, and uninterrupted enjoyment, and the mode of enjoyment must point out the nature of the prescription; for they must agree with each other: as, if the common has been used for other than commonable cattle, the claim must be of common appurtenant; and so of the rest.

Whatever difficulties may occur in considering these different rights, they evidently have arisen from the necessity of holding out an inducement to the cultivators of land in ancient times, before the use of artificial pastures was known; to continue their land in an arable state, by annexing to such land a sufficiency of common for the support of their cattle.

For this purpose, the policy of the common law annexed this right to all grants of lands by a lord of a manor, as incident to such grant ; and the same policy might have prevailed in the grants of private persons, as the most effectual security for the payment of the reserved rent, and due cultivation of their lands.

The only other distinction which it seems necessary for your Committee to take notice of, is, where the right of common is either stinted, or where it is unlimited. In the one case, the right only extends to the power of putting certain numbers of horses and other commonable cattle, at certain fixed times of the year, into such common pasture, under the denomination of *cattle-gaits*; every cow or ox being held equal to one cattle-gait, every 5 sheep to one cattle-gait, and every horse to one cattle-gait and a half; the proportion, however, sometimes varying according to the ancient usages of particular districts. In many of these stinted commons the commoners are owners of the soil, which distinguishes their rights materially from those above mentioned.

The foregoing distinctions appear to your Committee all that are necessary for the purpose of elucidating the nature of the several rights of common now existing in the southern part of the united kingdom ; and, aided by the general history of the country, they lead to this probable conclusion, That those rights could only have arisen in the infancy of agriculture, and of the arts therewith connected, which might render the existence of such rights more necessary. But whatever circumstances might have occasioned in those days, when land was of little value, and, from the scantiness of population, little in demand, such tracts of valuable territory remaining unoccupied and in common ; yet in this age of extended population, of increased wealth, and of diffused knowledge in agriculture and its attendant arts, any intermixture of property in the same land, as being a great, and in many cases an unsurmountable bar to all improvement, is an evil of such magnitude, that it need only be pointed out to a legislature, distinguished for its attention to promote the public interest, in order to have it remedied.

SECT. IV.

Of the Laws now in being for the Division of Commons; and the Alterations which might be made therein, for the Purpose of facilitating of such Divisions.

YOUR Committee thought it necessary, previous to their stating, for the consideration of the Board, any new regulations for facilitating the division of commons, in the first place to inquire into the nature of any proceedings for that purpose that might already exist, whether founded on common, or statute law, or in equity; since it would be extremely desirable, that any alteration should be made as nearly accordant to the laws in being as possible, varying perhaps in the mode, yet agreeing in principle, so as to be the more easily and effectually carried into execution.

In regard to the common law, it appears, that writs of partition and admeasurement, for the division of property, have existed at common law from time of earliest memory and record; and such were the ideas which at all times were entertained of the advantages to be derived by the public from the enjoyment of property in severalty, that there have been cases, where such proceedings have taken place in very ancient periods, and inclosures been made and supported, in a manner the most favourable to promote such partitions, divisions, and inclosures *.

Of the statutes which have passed in aid of the common law, there are only two which require to be particularly

* In the paper written by John Robinson, esq; on waste lands and commons (printed by order of the Board), from fol. 8 to fol. 18, both inclusive, may be found a full and accurate statement of the decisions of the courts, founded on the principles of the common law.

noticed.

noticed. The first is the statute of Merton*, which, according to Coke, was only an affirmance of the common law. By this statute such lords of manors as reserved sufficient pasture to their tenants, were impowered to improve the residue. By another act†, all doubts were removed whether the lord of a waste could approve against his neighbours as well as tenants. These are the only statutes which have any important reference to the subject in question. Your Committee need hardly remark, how insufficient they were, for bringing any considerable portion of waste lands into a state of cultivation. It was seldom that any common was sufficiently extensive, to afford a surplus of any moment, after the claims of those who had right of common on it were satisfied. It was hardly possible indeed, in many cases, to ascertain, what was a sufficiency of pasture; and where a common of turbary or estovers existed, the lord could not improve any part of that waste. The more opulent and powerful also the commoners of the kingdom grew, the more opposition they made, and the greater difficulty there was found in carrying on this proceeding; insomuch, that in modern times there is scarcely an instance of an *approvement*, as it is technically called, having taken place.

Besides these proceedings, founded on the common and statute law, various determinations appear heretofore to have been made in the court of chancery. But from the difficulties and expence attending such proceedings, they have been long disused; and no other means of obtaining a division of commons having been sanctioned by law, the parties have been compelled, where an unanimous consent could not be procured, and the common divided by arbitration, to apply to the legislature for special acts in order to divide, and to put into a state of severalty, lands, that otherwise would have remained waste, common, and uncultivated.

It is hardly necessary for your Committee to trouble the Board with any observation on the insurmountable bars which must lie in the way of improving by far the greater

* 2 Stat. Merton. 20 Hen. 3. Cap. 4.

† Stat. West. 2. 13 Edw. 1. Cap. 4. 6.

proportion of such wastes as remain in common, if some less troublesome and less expensive mode of procuring a division, is not established. The practice of applying to parliament is already decreasing, and must soon come to a stand, in consequence of the heavy charges attending such a mode of proceeding, which are particularly severe when the common is of small extent.—Many difficulties also arise in obtaining consents adequate to the rule at present laid down by parliament, in consequence of the obstinacy and perverseness of those, who, by the number of their votes, can defeat such a bill in the outset, though probably they are but little interested in the ultimate division. Other objections also to this mode of dividing commons may be adduced: The time of the legislature, it may be observed, may thus be taken up, and diverted from objects of more general importance than the division of any particular common can possibly be. When any point is contested before the committee appointed to draw up the bill, it is difficult to procure a proper attendance. The expence of employing solicitors in town; of sending agents and witnesses from the country; the charge of counsel, if any dispute arises; and the fees on passing of the bill;—all these, when joined together, furnish such a prospect of uncertainty, difficulty, and expence, as must soon put an end to all hopes of any farther improvement of our wastes, at least to any great amount, unless some means are speedily adopted for the purpose of facilitating their division.

There are certain leading principles however, on which it occurs to your Committee, that any alteration in the system of dividing commons ought to be founded; and these they will shortly endeavour to explain.

1. It occurs to them as a matter particularly desirable, to encourage the division of commons by the parties themselves interested therein; and if they choose to nominate commissioners, that such commissioners shall be authorized, under the provisions of the act, to proceed to the appropriation or allotment of the land in question: their award to be

subject to the review of the quarter sessions, or not, according to the previous agreement of the parties.

2. If the parties are not all willing to consent to the division, that any two or more of them may apply to have their share allotted or taken out in the manner after mentioned, *upon being at the whole expence of the division, reserving a claim against the other parties interested, for a proportionable share of the expence, when their allotments are taken up, on the same principles as in the case of party-walls.* And here your Committee beg leave to observe, that so far as they can judge, it is fair and equitable, that if two or more persons, interested in a common, are willing to improve it for their own and the general benefit, that it is hard on individuals, and impolitic in regard to the public, that any set of men should have it in their power to prevent them. Persons having a right of common, are in effect, though not in law, like parceners or joint-tenants (any one of whom can legally enforce a division of the property they hold in common); and if those who do wish for a division of a waste, are not compelled to inclose and improve the portion reserved for them (which, however, they will soon find it their interest to do), nor to be at any expence until they take up their allotments; in that case, it does not occur to your Committee, that they can have just cause for complaint, because others are permitted to cultivate their share of the land in question.

3. That in case a majority in value agree to a division, in that event, as well as in the preceding one, after due notice, and evidence before the judge of assize, of the interest which the parties had in the proceeding, and the requisite number of consents having been obtained, that such judge shall nominate not less than three, or more than five commissioners, to whom shall be given all the powers usually given to commissioners in private acts; the award of such commissioners to be enrolled with the clerk of the peace, and an appeal from their decision to the quarter sessions. The mere nomination of commissioners, and taking evidence of the number of con-

fents, and the interests of the parties, could not be attended with much trouble to the judges, as they must necessarily know, or could easily learn, from the many respectable individuals they meet with in the course of their respective circuits, who are the fittest persons to be employed in all the different districts, and the proof of interest, due notice, and consent, would in general be a matter of course, without any discussion. At any rate, the well-known zeal of the judges of England, for promoting the public interests, must prevent their hesitating to undertake any duty so likely to be generally beneficial. It is certainly extremely important, that so respectable a body of men as the judges, whose impartiality and judgment cannot be questioned, should have the nomination of commissioners, intrusted with such high powers; and it is equally desirable, that the award of the commissioners should be reviewed by those who had no hand in their appointment. This plan appears to your Committee perfectly accordant with every other principle that can be laid down for facilitating divisions, and at the same time to be possessed of these additional and peculiar advantages *.

4. Where parishes intercommon, that the same course of proceeding shall take place, for the purpose of dividing the same into parochial commons, on the application of any one of the parishes interested therein, to the judge of assize, who shall be empowered to nominate commissioners for that purpose; with an appeal, in this particular case, from the award of such commissioners to a jury.

Lastly, many complaints having been made of the remissness with which the commissioners sometimes proceed, and the exorbitant charges which they sometimes make, or

* If, from the number of applications, the judge of assize should find the nomination of commissioners too great a load, in addition to the usual business of the court, that privilege might also be given to the quarter sessions, if the parties chose to apply there; or the quarter sessions might have the nomination in the first instance, with the power of appealing to the judge of assize, in case there was any idea of partiality in the nomination.

expences which they occasion, that provision be made in the bill for the purpose of preventing such proceedings, or of furnishing the parties injured with the means of redress.

Such is the plan your Committee beg leave to recommend to the attention of the Board; in the formation of which they have had two great objects in view, namely,

1. *That all the proceedings connected with the division, shall take place near to the spot where the common lies: and, 2dly, that the form of proceedings shall be attended with as little trouble, uncertainty, and expence, as possible.*

Your Committee are ready to acknowledge, that no plan can be formed at once, on so vast and comprehensive a subject, that may not be liable to some objections; but as the cultivation and improvement of so great a portion of the territory of the public is at stake, they trust that the measures above proposed, with such alterations and improvements as may render them as little exceptionable as possible, will be adopted, that the division of commons may no longer be attended with any important difficulty. Any inconveniencies attending the measures suggested, as they are discovered in practice, may be amended by future regulation. It seems impossible, however, that the law can be put on a worse footing than it is at present, by which every possible obstruction and discouragement are thrown in the way of improving our wastes; as if it were a maxim of sound policy, and fit to be adopted by a wise legislature, to make those be subjected to as many charges and difficulties as possible, who presumed to increase the industry, the produce, or the cultivation of their country.

SECT. V.

On the Law and Practice of NORTH BRITAIN, in regard to the Division of Commons, and the alterations which might be made therein.

IF any person entertains an idea, that a general inclosing bill is an impracticable measure, his doubts will probably be removed, when he is informed, that such an act was passed about a century ago in Scotland, and has been found to answer the purpose thereby intended. As that act is distinguished by its simplicity and conciseness, it may not be improper to give it a place in this REPORT.

“ Act concerning the dividing of Commonities, passed in
“ the Parliament of Scotland, 17th July 1695.

“ Our sovereign lord, with advice and consent of the
“ estates of parliament, for preventing the discords that
“ arise about commonities, and for the more easie and ex-
“ pedit deciding thereof, in time coming, statutes and or-
“ dains, That all commonities, excepting the commonities
“ belonging to the king and royal burrows in burgage, may
“ be divided at the instance of any having interest, by sum-
“ mons raised against all persons concerned before the lords
“ of session, who are hereby impowered to discuss the rele-
“ vancy ; and to determine upon the rights and interests of
“ all parties concerned, and to value and divide the same,
“ according to the value of the rights and interests of the
“ several parties concerned ; and to grant commissions to
“ sheriffs, stewarts, baillies of regalitie and their deputies, or
“ justices of peace, or others, for perambulating and taking
“ all other necessary probation, which commissions shall by
“ reported to the said lords, and the said processes ultimately
“ determined

“ determined by them ; and where mosses shall happen to be
 “ in the said commonities, with power to the said lords to
 “ divide the said mosses amongst the several parties having
 “ interest therein in manner foresaid ; or in case it be in-
 “ structed to the said lords, that the said mosses cannot be
 “ conveniently divided, his majesty, with consent foresaid,
 “ statutes and declares, that the said mosses shall remain
 “ common, with free ish and entry thereto, whether divided
 “ or not ; declaring also, that the interest of the heretors,
 “ having right in the said commonities, shall be estimat ac-
 “ cording to the valuation of their respective lands or pro-
 “ perties, and which divisions are appointed to be made of
 “ that part of the commonity that is next adjacent to each
 “ heretor’s property.”

From this act it appears how simple the regulations are, which a century ago were thought sufficient in a part of the kingdom not distinguished for the scarcity of its wastes ; and under the provisions of that act many extensive commons have been divided, in a manner that has given satisfaction to the parties interested therein. By this law, it is proper to observe, that a division may be procured at the instance of *any one having interest* : But the expence of obtaining that division, though instituted at the suit of one, is defrayed by the whole parties concerned, in proportion to their respective shares.

However excellent this law is justly accounted, and however useful it has proved, yet there are two alterations in it which might render it still more effectual than at present.—The first is, that of taking away the exception ingrossed in the statute, by which no common can be divided in which either the crown or any royal borough is interested. For this exception no good reason can be assigned, and it probably originated from a jealousy which might naturally occur at the formation of a new system, but which the experience of almost a century ought before this time to have totally removed.—The second alteration might be adopted with great
 advantage

advantage from the practice of England. By the Scotch act, the court of session is empowered to grant commissions to sheriffs, justices of peace, or others, for perambulating and taking all other necessary probation, or, in other words, ascertaining the extent of the common, &c. and the result of the investigation is directed to be reported to the court of session, to be finally determined on by them. Questions however respecting the rights of parties, &c. are heard before the court of session alone. Where the common is of great extent, this is attended with great expence and much delay. The number of questions which may arise is more than a court of law, having a great load of other business to go through, can always attend to. It would be infinitely better, therefore, were the court of session to nominate commissioners, not less than three nor more than five, who should be intrusted with the same extensive powers which are given to the commissioners in England, when appointed by private acts of parliament. They ought not only to have the power of nominating surveyors, &c. but all questions arising in course of the proceeding ought, in the first instance, to be heard before, and decided by them. After they have given their award, it may then be brought under the cognizance of the court of session with effect, and all parties conceiving themselves injured may then have an opportunity of complaining, and of having their case fairly considered by the court. Every one must see how much easier it is to determine any litigated point after it has been once decided upon, than if it had never received any former judgment. The parties would in many cases probably acquiesce in the decision of the commissioners, and at any rate the great object would be attained, of having the business effectually done, and the common speedily divided, every delay in which must be attended with considerable loss both to the parties interested and to the public.

It is impossible on this occasion for your Committee not to remark, the benefit which may often be obtained, by comparing the laws of England and Scotland, and ascertaining

taining the advantages of which they are respectively possessed. It may often happen, that combining the principles of the two codes may be as useful to the laws, as an union of the two legislatures has proved advantageous to the strength, the security, and the happiness of both kingdoms; and where circumstances will admit of it, there cannot be a doubt, that it would be desirable to establish the same system of jurisprudence, or at least of agricultural legislation and police, over the whole island.

CONCLUSION.

On the Advantages to be derived, both by Individuals and the Public, from the Division and Improvement of the Wastes and Commons in the Kingdom.

WHOEVER has taken the trouble of perusing the preceding observations, will not be surprized to find, that in the Reports transmitted to the Board by its different surveyors, the passing of a General Inclosing Bill should be uniformly mentioned as the first and most essential means of promoting the general improvement of the country; and the importance of that measure has not as yet, perhaps, been so distinctly stated as it deserves. In general, those who make any observations on the improvement of land, reckon alone on the advantages which the landlord reaps from an increased income; whereas, in a national point of view, it is not the addition to the rent, but to the produce of the country, that is to be taken into consideration. It is for want of attending to this important distinction, that people are so insensible of the wonderful prosperity that must be the certain result of domestic improvement;—looking at the rental merely, which, like the hide, is of little value, compared to the carcase that was inclosed in it. Besides, the produce is not the only circumstance to be considered—that produce, by the art of the manufacturer, may be made infinitely more valuable than it originally was. For instance: If Great Britain, by improving its wool, either in respect to quantity or quality, could add a million to the rent rolls of the proprietors of the country, that, according to the common ideas upon the subject, is all the advantage that would be derived from the improvement:

improvement: but that is far from being the case—the additional income to the landlord could only arise from thrice the additional produce to the farmer; consequently, the total value of the wool could not be estimated at less than three millions: and as the manufacturer by his art would at least treble the value of the raw material, the nation would be ultimately benefited in the amount of nine millions per annum. It is thus that internal improvements are so infinitely superior, in point of solid profit, to that which foreign commerce produces. In the one case, lists of numerous vessels loaded with foreign commodities, and the splendid accounts transmitted from the Custom House, dazzle and perplex the understanding; whereas, in the other case, the operation goes on slowly but surely. The nation finds itself rich and happy, and too often attributes that wealth and prosperity to foreign commerce and distant possessions, which properly ought to be placed to the account of internal industry and exertion. It is not meant by these observations to go the length that some might contend for; namely, to give any improper check to foreign commerce. Extremes in all cases ought to be avoided; but it surely is desirable that internal improvement should at least be considered as an object fully as much intitled to attention as distant speculations, and when they come into competition, evidently to be preferred.

There are some, however, who, although they are ready to acknowledge that the improvement of the soil is the best source of national wealth, yet have formed an idea, that very little of the extensive wastes in the island are worth the cultivating, who are too apt to imagine that the climate in which they are situated is hostile to improvement; and, were it better, that the nature and quality of the soil are obstacles not to be surmounted.

In regard to the climate of such wastes, it is evidently worse in consequence of the want of cultivation.—At the same time, from the insular situation of Great Britain, the climate is infinitely milder and better than in any part of the continent of the same latitude. It is stated in one of the

Reports, on the most respectable authority*, that very fine barley and oats ripen in due season, on the summit of a hill in Forfarshire, elevated 700 feet above the level of the sea; and that in Invernesshire, at an elevation of 900 feet above the same level, wheat of a good quality has been grown.—Hence it may be inferred, that grain, and other articles of a similar nature, may be raised to such a height upon the sides and summits of all the hills in the island; and, in regard to grass, it is well known, that luxuriant crops of hay are obtained at the Lead Hills in Lanarkshire, elevated 1500 feet above the sea. The climate of this country, therefore, can hardly be urged as an objection to the improvement of the greater part of our wastes, either for grain or grass; as to trees, it is not to be questioned, that the larch grows in Italy on higher mountains than any we have in this island†.

In regard to the soil, though the greater part of the wastes, having never received any advantage from the labour of man, are at present of little value, yet the portion is not very considerable, that ought to be accounted totally barren and unprofitable, or incapable of yielding some useful and valuable production: 1-22d of the whole, or one million of acres, is certainly an adequate allowance.

This leads your Committee shortly to state the various purposes to which the remainder of such wastes may be appropriated.

1. The higher situated and the most sterile parts, ought undoubtedly to be devoted to plantations.—There is scarcely any spot, however rocky, or any soil, however unproductive, that will not yield valuable timber—an article which at present we are under the necessity of importing, at a great expence, from foreign countries. At first sight it may seem surprising, that a spot that would not produce a single blade of corn, will yet support the stately pine, or the spreading oak. But trees draw their nourishment from sources be-

* See Preliminary Observations to the Report of Forfarshire, by George Dempster, esq; p. 6.

† See Westmorland Report, Preliminary Observations, p. 9.

yond the reach of smaller vegetable productions, and by their leaves are also supposed to derive additional sustenance from the air that furrounds them. By plantations also even barren spots may in process of time be rendered fertile. The poorest soils, if covered with wood, from the leaves which fall, and the shelter they receive, improve every year in fertility, and when the trees are ready for the axe, become, in process of time, fit for cultivation.

2. Many of the higher wastes in the island might easily be rendered perfectly dry, and soon converted into excellent upland pasture. There that valuable article, fine cloathing wool, might be grown in perfection. The loftier the situation, and the shorter the herbage, the more valuable it would be; and the price which the article bears, joined to the profit of the carcase on which it grew, would amply compensate for all the expence of the improvement.

3. A much greater proportion of the wastes of this country than is commonly imagined might be employed in tillage.—The surface may appear barren and unproductive, but stratum may be found below, which, if incorporated with the soil above, may render it sufficiently fertile. This is a practice in husbandry, which has not yet been carried, in any degree, to the extent of which it is capable. It is an art pretty much in its infancy, which when brought to perfection must be productive of the most important consequences. As such, it will naturally call for the particular attention of the Board of Agriculture, to ascertain the principles on which it can best be conducted*.

4. A considerable proportion of the wastes of Great Britain, consists of land of a wet and boggy nature, which it has been yet supposed was the most difficult to improve and cultivate. Fortunately, however, discoveries have been made in the art of draining such bogs, by Mr. Joseph Elkington, a farmer of the county of Warwick, as renders the

* Mr. Kirwan, in his *Treatise on Manures*, to be found in the *Irish Philosophical Transactions*, vol. v. has thrown much light on this important subject.

improvement of swampy land a matter of much less difficulty or expence than formerly. Your Committee understand, with much pleasure, that Mr. Elkington has communicated his system of draining to those members of the Board who were appointed to meet with him upon the subject,—that he has undertaken to teach such persons as may be appointed by the Board for that purpose; and that there is reason to imagine that the practice of his useful art will be extended, in the course of the ensuing summer, from one end of the island to the other.—Bogs drained on Mr. Elkington's principles soon become of very great value as meadows, and in many cases may be converted into arable land.

Lastly, at least a million of acres of the waste lands in the kingdom may certainly be brought to an astonishing height of produce by irrigation.—This great means of improvement, though long established in some parts of the kingdom, yet in others has been unaccountably neglected. But when once that art is extended as it deserves, the advantages thence to be derived cannot easily be calculated,—for by it land is not only rendered perpetually fertile without manure, but the luxuriant crops which it raises produces manure for enriching other fields; and the manure obtained from that produce is another source of national wealth, that could not otherwise have been looked for.

Thus there is every reason to believe, that the wastes of this kingdom, if planted—or appropriated for pasture lands—or cultivated for the production of grain—or converted into meadow—or improved by means of irrigation, must necessarily be the source of infinite wealth and benefit to this country.

Here it may be proper to remark, that if there is a possibility of improving our wastes, the means for that purpose are more abundantly in our power than perhaps in any other country in the universe. Without entering much at length into so wide a field, it may be sufficient to remark, that there is none with such a capital capable of being de-

voted to so useful and profitable an object;—none where such a spirit of exertion exists, were all obstacles to the improvement of our wastes removed;—none where there is such a mass of knowledge on agricultural subjects;—none where such abundance of manures are to be found, particularly those of a mineral nature, without the aid of which it would be impossible to bring great quantities of waste lands rapidly into cultivation;—and lastly, none, where by means of a series of excellent roads, and canals every where rapidly extending, such manures can be so easily and cheaply conveyed to the lands they are destined to fertilize. These are advantages for improving wastes, which no other country enjoys in equal perfection, and which would soon be the means of cultivation of a very large proportion indeed of our at present useless territory, were full scope given to the industry and exertions of the people.—Nor ought the wealth to be derived from the improvement of our wastes to be alone taken into consideration. The increase of population, and above all, of that description of persons who are justly acknowledged to be the most valuable subjects that any government can boast of, merits to be particularly mentioned. His mind must indeed be callous, who feels himself uninterested in measures, by which not only the barren waste is made to smile, but the object of which is, to fill the desert with a hardy, laborious, and respectable race of inhabitants, the real strength of a country; because the fruitful nursery, not only of our husbandmen, but also of the fleets, the armies, and the artists of the nation. The additional number of inhabitants, who might thus receive occupation and subsistence, cannot easily be ascertained; but if the present population of Great Britain amounts to about ten millions, these wastes and commons, properly improved, might be the means of adding, at least, from two to three millions;—a number, it may be proper to observe, equal to that possessed by the United States of America, when they first erected the standard of independence against the mother country. The evils were then felt from the creation

of such an extent of population at a distance: from such an increase of people at home, instead of similar consequences being to be apprehended, additional strength and prosperity of every description may be looked for with certainty.

There is another point of view in which this subject ought also to be considered.—The improvement of wastes not only adds to the wealth and population of a state, but also renders it more defensible. An inclosed country is, perhaps, the strongest of any. Every hedge and ditch becomes a rampart, through which an enemy cannot easily penetrate, and which there is little difficulty in defending. Were this kingdom completely inclosed, and no opportunity afforded of fighting any pitched battle (the only thing to be dreaded in the event of an invasion) we should have little reason to apprehend the landing of any body of men, however numerous, or however well disciplined. They might do some mischief on the coast, but could never penetrate into the interior of an inclosed country. Indeed the best defence the capital can have, is not to suffer a spot of uninclosed ground to remain between it and the coasts in its neighbourhood; for, leaving the wastes of Kent and Sussex in their present open state, certainly gives an invading enemy an advantage, of which it would be politic to deprive them.

Before concluding this Report, your Committee think it necessary to take notice of one important circumstance. For some years past, this kingdom has been under the necessity of importing grain from other countries; and the importation seeming to increase, rather than otherwise, it was seriously apprehended that the agriculture of this island could not furnish grain sufficient for the use of its inhabitants.—Many reasons may be assigned for the scarcity of grain, among which the most obvious are, the increased population, consumption, and luxury of the people, and the greater attention that of late has been paid to the improvement of stock, in consequence of which considerable tracts of arable land

land have been converted into pasture. This, instead of being a public loss, was undoubtedly a national benefit. Land that for ages had been kept in tillage, and produced but scanty crops of grain, required rest, and was usefully appropriated for pasture.—But to complete the policy of this system, at the same time that arable land was converted into pasture, pasture land ought to have been rendered arable, and every acre of waste land fit for that purpose, that had remained untilld, perhaps since the Creation, would have soon repaid the labours of the husbandman by whom it was brought into culture.

Nor is the quantity of land, the cultivation of which would prevent the necessity of importing foreign grain, so considerable as is commonly imagined. The importation from foreign countries, for eighteen years, ending 5th January 1789, amounted only to 767,841 quarters of wheat, and 5,097,166 quarters of oats, rye, beans, &c. which is at the rate of 42,657 quarters of wheat, and 283,175 quarters of oats, &c. per annum.—The extent of ground which it would require, to raise that quantity of grain, cannot be calculated at more than 100,000 acres*. Let us then only convert that quantity of land from pasture into tillage, or indeed devote only $\frac{1}{10}$ th part of our waste lands for that purpose, and the business is effected.

When it is considered the high prices which grain and other articles of provision bear at present, which have been

* The ground necessary to produce this quantity of grain may thus be calculated :

42,657 of wheat, at the rate of 3 quarters per	Acres.
acre, would require	- 14,219
283,175 of oats, rye, beans, and pease, at 4 quar-	
ters per acre, would require	- 70,791
Total acres	- 85,010

It may be said, that no allowance is made for seed or fallow. Admitting that 15,000 acres more may be required on that account, the whole cannot be stated at more than 100,000 acres.

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rather

rather increasing than otherwise for some years past, and the fatal consequences which might arise, were these articles to become scarcer or more expensive, it surely cannot require any additional arguments to prove the necessity of not *losing an instant*, in taking such measures as may be thought most advisable for the purpose of acquiring from extensive tracts, situated in the very bosom of our country, the certain means of national subsistence and prosperity.

On the whole, the Committee beg leave to submit the following resolutions to the consideration of the Board :

1. That it appears, that a very considerable proportion of the territory of the United Kingdom remains in a waste and unproductive state, though capable of being converted to many useful purposes, by which the population and prosperity of the kingdom might be greatly augmented.
 2. That it also appears, that the improvement of such lands would be greatly facilitated, by the passing of such laws as might render the division of Wastes, where they are in common, less troublesome and expensive.
 3. That it appears expedient, that a motion be made in parliament, on the subject of WASTE LANDS AND COMMONS : and that the Board do lay before any Committee that may be appointed to take that subject into consideration, all the information that it has been able to accumulate, in regard to WASTE LANDS AND COMMONS.
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LETTER

TO

SIR JOHN SINCLAIR, BART.

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TO

SIR JOHN SINCLAIR, BART.

FROM

JOHN ROBINSON, ESQ.
SURVEYOR-GENERAL OF WOODS AND FORESTS.

5th APRIL, 1794.

LONDON:

PRINTED BY W. BULMER AND CO.

M.DCC.XCIV.



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JOHN S. BART. 5.00

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JOHN S. BART. 5.00

NOTES

OF THE

ABBREVIATIONS OF REFERENCES HEREIN, AND EXPLANATION.

REFERENCES.	EXPLANATION.
F. N. B. 125. B.	Fitzherbert's Natura Brevium, p. 125. B.
F. N. B. S. P. or S. C.	Do. Similar Point, or Similar Case.
18 E. 3d.	Statute 18 ^o Edward the 3d.
Br. Admeasurement, Pl. 3.	Brownlow Brevia Judicial. &c. &c.
2d. Institu. 370. S. P.	2 Coke's Institutes, page 370. Similar Point.
22d Assize, 65.	Book of Assize, page 65.
Toth. 118, &c.	Tothill, page 118, &c. &c.
4 Le. 41. Pl. 112.	4th Ley, page 41. Placita 112.
Roll. Rep. 363.	Rolle's Reports, page 363.
Ld. Raym. Rep. 407.	Lord Raymond's Reports, page 407.
Fin. R. 154.	Finch's Reports, page 154.
2 Vern. 103.	2d Vernon's Reports, page 103.
Jo. 306. Pl. 18.	Jones, page 306. Placita 18.
Cro. C. 440. Pl. 10.	Croke Cha. page 440. Placita 10.
3 Salk. 167.	3d Salkeld, page 167.
S. P. Skinn. 94.	Similar Point, Skinner, page 94.
Hil. 35th Car. 2. B. R.	Hilary Term, 35th Car. 2d. King's Bench.
10 Mod. 157. S. C.	10 Modern Cases, page 157. Similar Point.
Sty. 417. Trin. 1654.	Style's Report, page 417. Trinity Term, 1654.
Sid. 107. Pl. 19.	Siderfin, page 107. Placita 19.
Keb. 479. Pl. 7.	Keble's Reports, page 479. Placita 7.
Lev. 108.	Levinz's Reports, page 108.
Lutw. 157.	Lutwych's Reports, page 157.
Show. 106.	Shower's Reports, page 106.

TO

SIR JOHN SINCLAIR, BART.

PRESIDENT OF THE BOARD OF AGRICULTURE.

SIR,

THE Board of Agriculture having resolved, "That a committee be appointed to take the present state of the waste lands and common fields of this kingdom, and the probable means of their improvement, under their consideration, and to report the same to the Board:"

I beg leave, in consequence of the conversations had hereon, to submit to you the following Memoir, in hopes that it may be useful in the investigation of this point.

To bring into a narrow view a subject of such magnitude, and to shew the great improvements which may be expected to arise from a system for extensive inclosures of commonable lands, commons, and waste grounds, I submit to your consideration, that from the returns received by the Board, of the surveys made of each county in Britain, a statement be drawn up of the quantities of commonable lands, commons, and waste ground, in each respective county, and of the total quantity of each respective class of these lands throughout the kingdom; and that such statement should be annexed as an appendix to the Report to be made by the committee on this subject.

After a perusal of such paper, I apprehend it will appear unnecessary to remark the very great advantages which must arise to the public from a system to be formed for extensive and general inclosures and improvements of commonable lands, commons, and waste grounds, by converting such lands into pasture, meadow, or arable land; and by having the wastes not fit for such cultivation, planted for the growth of timber. The very great difficulties and

expencc which at present attend inclosures, are known and felt by almost every man.

The mode therefore to promote and effect, on fair and equitable terms, and at an easy expence, such inclosures, appears to be highly worthy of attention; and as useful to the investigation of this subject, I submit to the consideration of the Board,

First: A state of the Common Law, as it has been, and now stands respecting the partition and division of commonable property; and

Secondly: A state of such Statutes as have passed in aid of the Common Law for partition, division, and inclosing of commonable lands, commons, and waste grounds; and such as have passed for the purpose of planting.

On examining the first question, it appears that writs of partition and admeasurement for division of property have existed at common law from time of earliest memory and record; and the legislature seems to have been so much aware of the advantages which result to the public from the enjoyment of property in severalty, that there have been cases where such proceedings have been had, and inclosures made and supported in a manner most favourable to promote such partitions, divisions, and inclosures; as will appear upon a perusal of the several following extracts.

The writ of admeasurement of pasture lieth betwixt commoners who have common appendant to their freeholds, if one of them surcharge the common by putting in more cattle in the common than he ought to have common for there, then that commoner shall have this writ of admeasurement of pasture.

He who hath common appurtenant certain, or common by grant certain, shall be admeasured; and a tenant shall have an admeasurement against him; but he who hath a common appurtenant without number, or common in gross without number, shall not be stinted, nor a writ of admeasurement be against him.

By the writ of admeasurement,* all the commoners shall be admeasured as well as those who are parties to the writ.

But yet if any of those who are commoners†, which were not parties to the writs of admeasurement, &c. do surcharge the common after admeasurement,

* F. N. B. 126, 127. (1) S. P. As well those who have not surcharged the common, as he who hath surcharged it; and he who bringeth the action shall also be admeasured. F. N. B. 125. (B)

† F. N. B. 126, 127. (1) But note, the judgment on the admeasurement is only to extend between the parties; for if any other be aggrieved, he ought to

they shall not forfeit their cattle, nor the value of them that were in the pasture above the due number ; because they were not parties to the first writ ; nor the party shall not recover damages against them for this surcharge in this writ ; for the writ of *secunda superoneratione* lies not, but only against him, against whom, the first writ was sued forth.

Note, by all the justices,* that writ of admeasurement of pasture does not lie against him who has common appendant, nor against him who has common by specialty for beasts without number, but against him who has common appurtenant, and upon specialty to a certain number of beasts ; but then the other ought to plead it, and shew that he has it by specialty for so many beasts, and has put beyond the number of so many beasts.

In assize, by some, where sufficient common at the time of approvement is left to the commoner, it suffices, though it be not sufficient after. Br. (21. 8

In assize between lord and tenant, the lord had common in the soil of the tenant, which is held of him of his manor of D. of which the land in which the lord claimed common is held, and yet, per cur. the tenant may approve his own soil ; for though the statute does not speak, but that the lord may approve against his tenant and against his neighbour, yet the lord in this case is not but as a neighbour to the owner of the soil ; and the tenant as owner of the soil may approve, per cur. by which assize was awarded to inquire of the sufficiency of the common ; for the owner may well approve. Br. (22. 11

Assize of common of pasture ; the defendant said, that he had approved of the waste, saving to others sufficient common, and free coming in and going out, &c. The plaintiff said that he had not sufficient common ; *Prist. &c.* and the assize said that he had not sufficient common, by which it was awarded, that he recover his common, and it was held that the jury, by their discretion, shall ordain sufficient common to the plaintiff, so that the tenant may approve of the rest ; for so are the words in the statute of Merton, *quod nota* ; by which the parties agreed ; *quod nota*. Br. 125.

Assize of common ; J. said that W. is lord, and approved, &c. and left to the plaintiff and other tenants sufficient common, and the assize was charged Br. 135.

bring a new admeasurement. F. N. B. 126, 127. (I) in the new notes there (a) 18th E. 3. [30] Br. Admeasurement, Pl. 3. cites 6 H. 6. 2 Inst. 370. S. P. accordingly.

* Br. Admeasurement, Pl. 5. 22 Assize 65. Fitzh. Admeasurement Pl. cites S. C. F. N. B. 125. (C) in the new notes there (a) cites 22 Ass. 55. S. P. (but seems mis-printed, and that it should be (65) as in Br.).

surable, therefore not improvable; for the common being without number, the sufficiency cannot be proved. Dyer and Manhood J. held, that although it be without number, yet it may be reduced to a certainty, being by prescription; as the number of the cattle, which the best and most substantial tenant of the said tencement, at any time within the time of memory, had kept upon the said waste, and then the plaintiff, the lord, might improve leaving sufficient according to such rate.

If two lords of two manors* have two wastes adjoining, without inclosure or separation, but the bounds of each are well known by certain marks, the one may inclose against the other, though the tenants of each manor have reciprocally commoned there by reason of vicinage.

Lands that had been inclosed† for 30 years, by consent of most of the parishioners, were therefore ordered to continue inclosed.

The court compelled certain men‡ that would not agree to inclosures, to yield unto the same, and binds a college that would not consent, having lands within the said manor so inclosed.

Inclosures of waste and common decreed, being for common good;§

Where men have common in gross|| for a certain number of beasts, the lord may approve leaving sufficient for them [but Rolle says, quære this for the Statute, W. 2. cap. 50. (46) seems to be e contra.] Commons sans number is usually put in cases, but Coke says, he never knew such common granted, and therefore, when it comes in question, he said he will deliver his opinion thereof; but says, that notwithstanding such grant, the lord may common with him, and also the grantee ought to use the common with a reasonable number, per Coke, Ch. J. and the lord chancellor agreed particularly to all said by Coke—but Rolle remarks here, that F. N. B. says the writ of admeasurement lies not of common sans number.

* 4. Rep. 38. b. Mich. 26, 27 Eliz. cited by the Reporter, as lately adjudged in B. R. in case of Smith v. How.

† Toth. 174. 4 Jac. Piggot v. Kniveton. A common that hath been inclosed for 30 years, shall not afterwards be flung open. Vern. 32. Pl. 29. Hill. 1681, Silway v. Compton.

‡ S. P. Toth. 174. P. 10 Jac. Magdalen Coll. in Oxon v. Hyde. Toth. 175. 8 Car. S. P. Barkley v. Evet. Toth. 174. Mich. 17 Jac. Cartwright v. Drop.

§ Toth. 175. 12 Jac. Freak v. Loveden.

|| Rolle Rep. 365. Pl. 18. Pasch. 14 Jac. in the Star Chamber, in case Proctor v. Mallorie.

Where they have common in gross sans number, the lord cannot approve against

Parties that have interest in the common,* and not privy to the agreement to inclose, shall not be bound ; but decreed that it should not be in the power of one or two wilful persons to oppose a public good.

A former decree and an award by which the commons and inclosures between the lord and his tenants, and lands in the bill mentioned, were bound and ascertained, till the defendant, who had now purchased the manor, refused to be bound by it, was confirmed accordingly.

Fin. R. 154
26 Car. 2.
dows v. Pal

A decree made for an inclosure twenty years since, to which the defendant the lady Widrington's husband, had agreed in his life time, and she having an estate of about £ 25 per ann. within the manor, would now disturb the inclosure ; and though in strictness her husband's consent could not bind her interest, yet it being proved in the cause, that her estate was much improved by the inclosure, and that she designed only to make an unreasonable advantage to herself, the court decreed the inclosure should stand.

Vern. 456.
1687. Rotl
Widrington
C. 2 Vera.
Pl. 206.

Agreement between lord and tenants to stint a common,† is more to be favoured than to inclose ; and one or two humourous people standing out, and not agreeing, will not hinder the court's decreeing it ; and decreed accordingly.

Lord of a manor inclosed part of a common,‡ and there being young wood and timber growing thereon, the plaintiff insisted, it was an improvement within the statute of Merton. W. 2. 46. The court thought fit to continue the injunction, and directed a trial to be had at the next assizes, whether sufficient common was left for the tenants.

them, per Powel, J. Ld. Raym. Rep. 407. Mich. 10. W. 3. It is to be observed that neither this statute, nor the statute of Merton extends to any common, but to common appendant or appurtenant to his tenement, and not to a common in gross to a certain number, 2 Inst. 475.

* Chan. Cases 48. 16 Car. 2. Thirveton v. Collier. 3 Chan. Rep. 13. Anon. but S. C. in totidem verbis. Nels. Chan. 79. 16 Car. 2. Anon. but S. C. in totidem verbis. The court will not bind a man to an inclosure, that never consented. Toth. 175. 2 Car. Ingram v. Wells.

† 2. Vern. 103. Pl. 98. Trin. 1689. Drelabere v. Bedingfield. But where such agreement was made by the greatest part of the landholders, and opposed by the rector, and about nine others, the court could not decree it, though it was insisted, that a decree was made 1 W. 3. for a like stint in the hamlet of Southam, in the same parish ; but the bill was dismissed at the Rolls, and affirmed upon an appeal. Vern. 575. Pl. 520. Hil. 1706. Bruges v. Curwin.

‡ 2. Vern. 301. Pl. 290. Mich. 1693. Weekes v. Staker. In a like case two issues were directed to be tried, whether some of the defendants had right of common there, and whether sufficient common was left for the tenants, and an in-

S. Rep. Pasch.
Dec. 2d. in
nc. v. Palmer
al.

Bill brought by plaintiffs as tenants of the manor of Walton, in the county of Surry, to establish their right of common of pasture and turbary in the waste of the said manor, and for injunction against defendant Palmer, lessee of the manor for years under the crown, to stay his digging of brick earth, and making brick, and inclosing part of the common, &c. Motion upon the bill filed, and affidavits of making brick, and inclosing part of the common, till answer and further order. King C. assisted by J. Jekyle, Master of the Rolls, denied the motion; for that the lord of common right was intitled to the soil of the waste, and the tenants had only a right to take the herbage by the mouth of their cattle; and by statute of Merton, the lord might inclose part of the waste, leaving sufficient common; that at common law, in an action brought against the lord, the tenant must allege in the declaration, that there is not sufficient common left, or he cannot maintain the action; and if that should be the present case (though no such matter is made out by the affidavits) the tenants may have their remedy at common law; that the lord has a right to open mines in the waste of the manor, and why not to dig brick earth; especially in the present case, where the bricks are made for one of the tenants of the manor, and to be employed in building upon the manor. As to the inclosure, it was too soon for an injunction before answer.

On the second head, what statutes have passed in aid of the common law for the purpose of promoting inclosures. It is to be observed, that questions upon improvement of commons arose in very early times, and occasioned the statute of Merton, and the several other statutes hereinafter stated, viz.

Because great men having infeoffed others their tenants* of small tenements

injunction to quiet the possession in the mean time was continued, though a new inclosure, and made not above two years before the bill exhibited. 2. Vern. 356. Pl. 322. Hil. 1697. Arthington v. Fawkes.

* 2nd Stat. Merton. 20 Hen. 3. cap. 4. Lords may approve their wastes, leaving sufficient common.

Cases and Readings on these Statutes.

Hereby it appears, that the lord could not approve by the order of the common law; because the common issued out of the whole waste, and of every part thereof; and yet see Tr. 6 H. 3d. where the lord approved two acres, and left sufficient, the tenant brought an assize, and the special matter being found, the plaintiff retraxit se. The purview of this statute extends only for the lord to make an improvement against his tenant, and not against any stranger, nor where the lord had common appendant in the tenancy, as he may have; but see the statute of W. 2. 2 Inst. 85.

Coke, Ch. J. said, that the statute of Merton was only an affirmance of the common law; for at the common law the lord might approve, leaving sufficient for his tenants, and

in their great manors, complained that they could not make the profit of the residue of their manors, as of wastes, woods, and pastures, though the feoffees had pasture sufficient for their tenements; it was provided, that whensoever feoffees bring an assize of novel disseisin for their common of pasture; and it is recognized before the justices, that they have as much pasture as sufficeth for their hold, and that they have free egress and regress from their hold into the pasture; then let them be contented therewith, and they of whom they have complained shall go quit, for that they have made their profit of their lands, waste, woods, and pastures. And if they allege that they have not sufficient pasture, or not sufficient egress and regress as appertaineth to their hold, then let the truth be inquired by assize. And if it be found by assize, that the same deforceors have disturbed them of their egress or regress, or that they have not sufficient pasture, then shall they recover their seisin by the view of inquest, so that by their discretion and oath, the plaintiffs shall have sufficient pasture, and egress and regress, and the disseisors shall be amerced, and yield damages. And if it be found by the assize, that the plaintiffs have sufficient pasture, and sufficient egress and regress, let the other make their commodity of the residue, and go quit.

that so are divers cases in time of H. 3. Fitzh. Tit. Approvement, which was before the statute, and this appears by the writ of quod permittat, which is quod tantum habeat pasturam, &c. having regard to his frank tenement; and the writ of admeasurement is quod habeat plura animalia quam debeat, in respect to his frank tenement; to which the lord chancellor agreed.

Roll. Rep. 365. Pl. 18. Pasch. 14 Jac. in the Star Chamber, in case of Proctor v. Mallorie. Before the statute the lord could not approve, per Windham, J. Sid. 106. Pl. 17. Hil. 14 and 15 Car. 2d. B. R.

When a lord of a manor (wherein was great waste grounds) *did enfeoff others of some parcels of arable land*, the feoffees ad manutened. servitium focæ, should have common in the said wastes of the lord for two causes: 1st. As incident to the feoffment; for the feoffee could not plough and manure his ground without beasts, and they could not be sustained without pasture, and by consequence the tenant should have common in the wastes of the lord for his beasts which do plough and manure his tenancy, as appendant to his tenancy, and this was the *beginning of common appendant*. The second reason was for advancement of agriculture and tillage, which was much favoured in law. 2 Inst. 85, 86.

The lord may approve against a tenant that hath common of pasture appendant; but if the lord grants common pasture within his wastes, there is no approvement by this act against common in gross, for the words of the statute be, quantum pertinet ad tenementa sua, &c. And so was the law taken and adjudged soon after the making of this act, and latter authorities agree with the same; and albeit the common appendant be without a certain number, as to have sufficient pasture for beasts, quantum pertinet ad tenementa sua, which may be reduced to a certainty, for id certum est quod certum reddi potest, and therefore this act doth extend to it; and the writ of admeasurement of pasture doth lie only for and against such commoners as have

e of Westm.
13th Edward
1st. cap. 7.
Writ given to
guardian and heir;
the process
remed.

A writ of admeasurement of dower shall be granted to a guardian; neither shall the heir when he cometh to full age, be barred by the suit of the guardian, if he sueth against the tenant in dower feignedly and by collusion, but that he may admeasure the dower after. And as well in this writ as in a writ of admeasurement of pasture, more speedy process shall be than hath been used hitherto; so that when it is come unto great distress, days shall be given, within which two counties may be holden, at which open proclamation shall be made, that the defendant come in at the day; at which day if he come in, the plea shall go forward. And if he do not come, and the proclamation be testified by the sheriff, upon the default, they shall proceed to make admeasurement.

Upon the second overcharge of pasture,* the plaintiff shall have remedy in

common appendant; for the words of the writ be, et ad ipsos pertinet habendum secundum liberum tenementum suum, &c. so as common appendant, be it certain or uncertain, is within this statute; and so is common appurtenant certain or uncertain, for pertinet extendis as well to common appurtenant as appendant. 2 Inst. 86.

Throughout all this statute pastura and communia pastura is named, so as this statute of approvement doth not extend to common of piscary, of turbary, of estovers, or the like. 2 Inst. 87.

By the approvement of part, according to this statute, that part by this act is discharged, insomuch as if the tenant which hath the common purchases that part, his common is not extinguished in the residue. 2 Inst. 87. And yet it may be tried in an *action of trespass*, for many times he shall fail to have an assize. Or if the lord doth inclose any part, and leave not sufficient common in the residue, the commoner may break down the whole inclosure, because it standeth upon the ground which is his common. 2 Inst. 88. A commoner brought an assize of common of pasture belonging to his freehold; the tenant said he was lord, &c. and approved part of his waste, and left the plaintiff sufficient common, &c. The plaintiff denied that he left sufficient common, and thereupon issue was taken, and Sir William Herle, Ch. Just. of the court of C. B. took the assize, and the assize found, that the plaintiff had not sufficient common; whereupon the court did award, that the plaintiff should recover his common, &c. and the recognitors of the assize were going from the bar; and albeit the issue was found against the tenant, yet for his advantage the recognitors of the assize ought to come back again, and to ordain by their discretion and oath, sufficient common to the plaintiff, so that the defendant might approve of the remnant, by this statute of Merton, as Freewood affirmed; whereupon Sir William Herle perused the statute, and found the statute as Freewood had said, and therefore was in purpose to have caused the jurors to have come again (the record yet being in his breast) to appoint sufficient common to the plaintiff, according to the statute; but it was prevented, for that the parties agreed. 2 Inst. 88.

* Statute of Westm. 2d 13th Edw. 1st. cap. 8. Secunda superoneracione.

Though the statute Westm. 2, 13th Edw. 1st. cap. 8. says that in case of a surcharge after an admeasurement of pasture, no remedy had been yet provided; yet Lord Coke says, he had seen a record in 11 H. 3. in the archives of the Tower of London, where a writ de secunda superoneracione was granted 2. Inst. 370.

this manner; if the admeasurement were before the justices, the plaintiff shall have a writ judicial, that the sheriff, the parties being summoned, shall inquire of the second overcharge, which if it be found, it shall be returned before the justices, under the seals of the sheriff, and of the jurors: and the justices shall award to the plaintiff damages, and they shall put into their estreats the value of the beasts which were put into the pasture after such admeasurement above the due number, and shall deliver the estreats unto the barons of the Exchequer, that they may thereof answer unto the king. If such admeasurement be made in the county, a writ shall go out of the Chancery, that the sheriff shall inquire of such overcharge, and that of the beasts put in above the due number, or of the value of them, he answer to the king at the Exchequer; and all writs de secunda superoneratione that pass out of the Chancery, shall be inrolled, and at the year's end, the transcripts shall be sent into the Exchequer, under the chancellor's seal. In the same wise the writs of redisseisin shall be inrolled, and sent into the Exchequer at the year's end.

The statute of Merton,* provided between the lord and his tenant, shall hold place between lords of waste, woods, and pastures, and neighbours *saving sufficient pasture to their tenants and neighbours, so that the lords of such*

When the plea is removed before the justices thereupon pleading, or confessing before them after admeasurement made and returned, judgment shall be given by the justices; but if the plea be not removed, the admeasurement shall be inquired of, and made before the sheriffs, 2 Inst. 370.

By the writ of secunda superoneratione, the plaintiff shall recover his damages against him that was defendant in the first writ, and also he shall forfeit unto the king, the cattle which he put in over the due number, after the admeasurement made. And all this is by the statute of Westminster. F. N. B. 126. (H).

* Statute Westm. 2. 13 Edw. 1. cap. 46. May approve against their neighbours. Recites, the statute of Merton and enacts, because in that act, no mention was made between neighbour and neighbour, the doubt was, whether that act extended only between lord and tenant; and, therefore, many lords of wastes, woods, and pastures, have been letted to make approvement by the contradiction of neighbours, though they had sufficient pasture; for remedy whereof, this statute was made, 2 Inst. 474.

Note, it is said that the lord could not improve against a neighbour, but that the lords were hindered by the contradiction of the neighbours; for by the common law, the lord might improve against any that had common appendant, but not against a commoner by grant, 2 Inst. 474.

Vicinus is properly, qui una in eodem vico est, but here it is taken for a neighbour, though he dwells in another town, so that the commons and towns be adjoining together; and if the lord hath common in the tenant's ground, the tenant may improve within this act, for there the lord is in this case vicinus, 2 Inst. 474.

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title.

wastes, woods, and pastures, may make improvements of the residue. And this shall be observed for such as claim pasture as pertaining to their hold : but if any claim common of pasture by *special scoffment, or grant*, for a certain number of beasts, or otherwise than he ought to have of common right, he shall have such recovery as he ought by form of the grant made unto him : by occasion of a * *windmill, sheepcote, dairy, enlarging of a court, or courtilage*. No man shall be aggrieved by assize of novel disseisin of common pasture. And where sometimes it chanceth, that one having right to improve doth levy a ditch, or an hedge, and some by night, or when they hope not to be espied, do overbrow the bedge or ditch, and men of the towns near will not indict such as be guilty, the towns near adjoining shall be distrained, to raise up the bedge or ditch again at their own cost, and to yield damages. And where one usurpeth common in the time that heirs are within age, or a woman is covert, or whilst the pasture is in the hands of tenants in dower, or of other particular estates ; they who have such entry from the time in which the writ of Mordancester runneth, if they had no common before, shall have no recovery by writ of novel disseisin if they be deforced.

* Here be five kinds of improvements expressed, that both between lord and tenant, and neighbour and neighbour may be done without sufficient common to them that have it (any thing herein, or in the statute of Merton to the contrary, notwithstanding) and these five are put but for examples ; for the lord may erect a house for the dwelling of a beast-keeper, for the safe custody of the beasts, as well of the lord as of the commoners depasturing there in that soil ; and yet it is not within the letter of this law, 2 Inst. 476.

Inclosures destroyed to be made good.

That is, to indict them at the king's suit, either of riot, force, or trespass ; but seeing no time is appointed, the law doth appoint (as in many cases it doth) a year and a day, for the indicting the misdoers ; and by the indictment, the lord shall know against whom to bring his action, 2 Inst. 476.

If the bordering towns do not, within a year and a day, indict the misdoers, then shall the lord, or other party grieved, bring his action upon this branch against the towns bordering round the town where the fact was done, and judgment shall be given, that they shall, at their proper costs, make the ditch or hedge, &c. so it was holden in the Star Chamber. Hil. 14 Jac. In Sir William Mallorie's case. 2 Inst. 476. Coke, Ch. J. said he had seen an ancient reading upon this statute, wherein it was held that the next vill shall have a year and a day to indict the offenders, and if the vill does not do it within the said time, then it shall not be indicted upon the statute to repair the inclosure, but the party grieved shall have an action upon this statute, as a man that is robbed shall have an action upon the statute of Winton against the hundred ; and said that there is a note in the margin of the reading, that in time of E. 4. Piggot J. held accordingly at a reading and that it seemed to him to be good law. And the Lord Chancellor afterwards

Cases adjudged on the above Statute.

Upon exception taken to the writ,* a new distringas was awarded against the vills adjacent, and issues were estreated.

There need not be a year before the offenders should be indicted,† but there ought to be a convenient time for the country to inquire, who were the prosterners, and the court shall adjudge what time is convenient; per Banks Att. Gen. cites a resolution in 12th James.

The court was moved for a distringas against the inhabitants of H. for throwing down of banks of the Earl of Bedford's, in his drained land, per Roll. Ch. J. take it, but at the return of the distringas the inhabitants may plead to you, notwithstanding Noy, the late king's attorney would not have suffered it. Sty. 1654

Judgment was had against the inhabitants of S. to repair at their own proper costs the fences and dikes thrown down; because it was not done, a writ of inquiry of damages issued, and £ 500 damages found, and a distringas to the sheriff to levy it upon the vill; upon which they came by their counsel, and prayed to have liberty to plead, inasmuch as by this way they are condemned unheard, and that by an inquest against which no attain lies. And it was doubted whether a scire facias ought to have issued before the distringas; but upon consideration the court thought, that the distringas ought to have contained a scire facias in it; and so they obtained leave to plead. Lid. Hil. 2. E Mod shan

After money levied by distringas † containing a fieri facias grounded on W. 2. cap. 46. for throwing down inclosures, and inquisition taken by the sheriff; Jones prayed that the money might be brought into court; and remain, and that he might have time to plead, which the court granted.

agreed particularly to all that was said by Coke, Roll. Rep. 365. Pl. 18. Pasch. 14 Jac. in the Star Chamber, in the case of Proctor v. Mallorie.

* Jo. 306. Pl. 18. Mich. 8 Car. B. R. The case of the Forest of Dean, alias Gibbon's case. Cro. C. 280, 281. Pl. 20. S. C. accordingly.

† Cro. C. 440. Pl. 10. Hil. 11 Car. B. R. in case of the King v. Epworth. Adjudged a year and a day is not necessary to be allowed, but a convenient time; and of that the court may properly judge. 3. Salk. 167. Pasch. 1 W. 3. The King v. Penrith inhabitants. S. P. Skinn. 94. Hil. 35. Car. 2. B. R. per cur. in Creswick's case. The statute supposes a reasonable time ought to be allowed for indicting before the action should be brought on the statute; per curiam. 10. Mod. 157. Pasch. 10 Ann. B. R. The Queen v. Gruelthorp inhabitants. All the precedents are at least a year's time. 10. Mod. 157. S. C.

‡ Keb. 479. Pl. 7. Pasch. 15 Car. 2. B. R. the King v. the inhabitants of the Forest of Dean.

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12. Pl. 10.
16 Car. 2.
the King
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y villis in
Huntington.

Distringas upon the statute of Westm. 2. for throwing down inclosures against the inhabitants of proximis villis; two of each vill came and pleaded for themselves and the other inhabitants of the several villis, that the fences were thrown down in the day-time, when the persons might be known; absque hoc, that they were thrown down in the night, or at such time that the offenders could not be known, and so issue joined in the disjunctive; and now at the trial at bar, it was said for the defendants, that if the throwing down was either in the day, or in the night, so * public that the malefactors were known, it is not within the statute, to which the court agreed; for the statute was to give remedy in cases where the malefactors not being known, the parties were without remedy by trespass, &c. But if it was done in the day or night before the face of the owners, so that they have remedy by trespass, &c. this is not within the statute; and upon the evidence it appearing to be done publicly, and yet by the defendants, the jury by direction of the court found for the defendants.

Upon an inquisition for throwing down fences and £ 80 damages assessed a distringas issued, and defendants came in, and plead that it was not done noctanter, which was found against them, and second damages given; and it was moved to set aside the first damages. 1st. Because the inquisition is only to ascertain what villis have done it, to the intent that a distringas may go out, and it was never intended to conclude any in point of damages, being only an inquest of office, against which no attain lies. 2dly. Because those damages are assessed upon us before we were summoned, and so we were not heard for our excuse, and to mitigate them, but condemned and concluded not heard, nor not summoned, and they cited Cro. C. 280. and Cro. E. 859. 2 Inst. 477. Cro. Car. 580. and they said, that they might plead to the right upon the distringas, so that it is not reason that they should be concluded as to the damages by the inquisition; but per cur. the first damages should stand, and shall not be vitiated by the second, because the second verdict as to the damages is void, inasmuch as the sole matter to be inquired upon the second issue is the noctanter, but for better security, they directed the prosecutors to release the second damages, and as to the mischief objected, that the damages being assessed by inquest of office, no attain lies that is true, but cannot be properly said mischief, because it is so enacted by parliament, that the damages shall be assessed as before; yet if they are excessive, the party is not without remedy; for when they came in to plead the noctanter, if the

damages were outrageous, they ought to have taken in their plea, viz. protestando, that the damages were outrageous, and after might have pleaded, 1st. the damages were only of such a value, and upon this other issue should be taken; wherefore the counsel of the defendants, in this case moved, that they may now plead to the excessiveness of the damages, but inasmuch as they have not taken it by protestando, before the first issue found against them, the court would not suffer them, but gave judgment for the plaintiff, and that the £ 80 being levied upon the distringas, they shall have it out of the court, notwithstanding the second damages given by the second verdict.

An inquisition was returned upon the statute * against pulling down inclosures. They took issue as to the damages only. It was moved that before the trial for the damages there might be judgment given to have them set up again, having been long down; Twisden said, when you have judgment for the damages, then one distringas will serve for setting up the inclosures and the damages too.

If the damages are excessive, † when the parties come in to plead the noc-tanter, they may take by protestation, that the damages were excessive, and after plead, that the damages were not but of such a value.

An information for a riot lies in the Crown Office ‡ for breaking fences and inclosures in Hertfordshire.

All jointenants and tenants in common § of any estates of inheritance shall be compelled to make partition by writ, de partitione faciendâ; to be devised in the Chancery, in like manner as coparceners.

Every of the said jointenants or tenants in common, and their heirs after Section

* Mod. 66. Pl. 12. Mich. 22 Car. 2. B. R. Anon. 2. Keb. 663. Pl. 21. the King v. the inhabitants of East Grinstead; the court præter Keeling Ch. J. inclined to grant a new distringas, as to the rebuilding the fences, being confessed to be down by the other issue; but time was given to plead de novo. Ibid. 683. Pl. 2. the court ordered the issue as to the damages to be tried first, and then a writ may be granted for setting up the fences, and for the damages also. Ibid. 723. Pl. 127. S. C. The trial at the bar being over as to the damages, the court granted a distringas to levy and set up the fences, but would not order it by any day certain, but to follow the process of the court, and so for the issues.

† Per cur. Lutw. 157. Pasch. 32 Car. 2. Malabar's case.

But this must be taken by protestation before the first issue found against them.

‡ Show. 106. Mich. 1 W. & M. the King v. Bercket & al.

§ Statute 31 Hen. 8. c. 1. sect. 2. Jointenants and in common compellable to make partition.

partition made, shall have aid of the other to deraign the warranty paramount, and to recover for the rate, as it is used between coparceners.

1. Jointenants and tenants in common for term of life or years, where one of them shall have an estate for life or years, with the other that have estates of inheritance or freehold in any hereditaments, shall be compellable by writ of partition out of Chancery upon their case to make partition.

No such partition to be made by force of this act shall be prejudicial to any persons other than parties to the partition.

2. Recites an indenture of agreement made by his majesty with Sir Richard Page and other divers parties, for the purchase of divers lands and tenements within the parishes of East Mulsae, West Mulsae, Walton, Esher, Weibridge and part of Cobham, in the county of Surry, to be annexed to Hampton-Court and erected into a free chase, &c. confirms such agreement, establishes such chase, and empowers his majesty to constitute officers, ministers, and keepers of the said chase and warren, within the said parishes and limits.

Adds thereto divers other manors, lands, and tenements, purchased by his majesty.

3. And because that the said manor of Hampton Court is thus, as is aforesaid, decorated and environed with things of high and princely commodities: Be it further enacted, by authority of this present parliament, that the manor of Walton upon Thames, in the said county of Surry, being parcel of the Dutchie of Lancaster; and the manor of Walton Legh, in the said countie of Surreie, late purchased by the king's highnesse of Giles Legh, Esquire, deceased, and the house of Oteland, and all lands, tenements, rents, services, and hereditaments, in Weibridge, Walton, and Chertsie, in the said counteie of Surreie, late purchased by the king's highness of John Rede, sonne and heire of William Rede; and the manors of Biflete and Weibridge, in the said countie of Surreie, being parcel of the Dutchie of Cornewall, and all the lands and tenements in Walton and Weibridge aforesaid, late purchased by the king's highnesse of John Goldwell and his wife; and all those lands and tenements in Walton as aforesaid, late purchased by the king's highness of John Carlton; and the manor of Est Mulsae, in the said countie of Surreie, late purchased by the king's highness of the presidend and the schollers of Corpus Chriti College in Oxford; and the manor of Mulsae in the said countie of Surreie, which late belonged to the late monasterie of Marten, in the said countie of Surreie; and the manor of Sanden, in the said countie of Surrie, late pur-

chased by the king's highness of the maister and bretheren of the hospitall of Saint Thomas Spittle in Southwarke, in the said countie of Surreie; and the manor of Weston in the said countie of Surreie, late purchased by the king's highness of the abbesse and convent of the monasterie of Barking in the countie of Essex; and the manor of Imworth in the said countie of Surreie, late purchased by the king's highness of Thomas Duke of Norfolk; and the manor of Esher in the said countie of Surreie, late purchased by the king's highness of the revrend father in God, Stephan Bishop of Winchester; and the lands and hereditaments, with the appurtenances called Heiwood, lying within the said chase, which late belonged to the late priorie of Newarke, in the said countie Surreie. And all those manors, lands, tenements, and hereditaments, lying within the said chase, which Sir Richard Page, Knight, hath lately bargained, and sold unto our said sovereigne lord the king, and all lands, tenements, and hereditaments, which be the said Sir Richard Page's, lying and being within the said chase; and all other manors, lands, tenements, rents, reversions, services, and hereditaments, within the limits and territorie of the same chase, which the king's highness before this time hath obtained, bought, or purchased, of any person or persons, bodies politicke or corporate. And all the fee farme or yeerely rent, or annuitie, of the borough or towne of Kingston upon Thames, in the said countie of Surreie; and the manors of Hanwoorth and Kenton, otherwise called Coldkennington; and the parke of Hanwoorth and Coldkennington in the county of Middlesex; and the manor of Feltham in the said countie of Middlesex, which manor of Feltham was late purchased by the king's highness of the maister and bretheren of the hospital of Burtonlazar in the countie of Leicester; and the manor of Todington in the said countie of Middlesex, late purchased by the king's highness of the abbat and convent of the monastery of Westminster in the countie of Middlesex: and all lands, tenements, and hereditaments, lying in the parish of Hampton in the said countie of Middlesex, late purchased by the king's highness of Thomas Arthur, Thomas Gone, John Vuydale, John Upton, Thomas Ellis, and John Lewis, or any of them: and all lands, tenements, and hereditaments, in the parish of Hanwoorth in the said countie of Middlesex, late purchased by the king's highness of John Williams, John Combes, Richard Harris, William Cooper, Robert Wats, Thomas Fitzwater, Richard Lawrence, Thomas Carpenter, John Bicks, Paule Coke, and the parson of the parish of Hanwoorth aforesaid, or of any

of them : and all the lands and tenements in Kenton in the said countie of Middlesex, lately purchased by the said our sovereigne lord the king of the maister and bretheren of the hospitall of Savoie in the county of Middlesex ; and all other manors, lands, tenements, and hereditaments in Kingston, Hanworth, Kenton, Coldkennington, Feltham, Todington, and Hampton, which our said sovereigne lord the king before this time hath bought, purchased, or obtained of any person or persons, bodies politicke or corporate, shall from hencefoorth be perpetually united, annexed, deemed, reputed, and taken to be part, parcell and members of the said manor of Hampton Court. And that the same manor of Hampton Court, together with all other the said manors, lands, tenements, and other the premises above rehearsed and specified, so united and annexed to the same manor of Hampton Court, shall from henceforth be named, called, accepted, and taken, the honor of Hampton Court. And that the said manor of Hampton Court shall from henceforth be the chiefe and capitall place and part of the said honor of Hampton Court.

Sect. 4. Enacts, that the said honor and chase of Hampton Court, and all manors, lands, tenements, hereditaments, and other the premises above rehearsed, shall from henceforth be in the order, survey, rule, and governance of the court of augmentations of the revenues of our sovereigne lord the king's crown, and to be granted, let, and set to ferme by the officers and ministers of the court, in such manner and forme as other the manors, lands, and tenements appointed to the same court, bee or ought to be letten or granted. And that all the farmes, issues, revenues, and profits, coming and growing of the premises, and of every part thereof, shall be taken and received to the king's use, by the ministers and officers of the same court, in such manner and forme as is used and had of other manors, lands, and tenements, committed to the order, survey, and governance of the said court of augmentations ; any act, statute, ordinance, custome, or use heretofore had, made or used to the contrarie thereof notwithstanding.

On the dissolution of the monasteries, his Majesty, Henry 8th became entitled to the possessions vested in the monastery of Sion, and thereby obtained all the other parts of Hounslow Heath which were not before included within the parishes and places above stated in the last preceding act of parliament, and thereby erected into a chase, annexed to Hampton Court palace. And thereon the following act was passed, viz.

Where the kinges majesty is at this present seized of one estate of inheritance of the waste ground and soyle commonly called Hounsloe Heath ; containing in it selie foure thousand two hundred fourescore thirteene acres and one roode, lying and extending into the fields, parishes, and hamlets of Istelworth, Brainford End, Twickenham, Heston, Feltham, Harlington, Craine-field, Harmondsworth, Stanwell, Hanworth, Bedfount, Hampton, Hounsloe, and Todington, in his graces countie of Middlesex. His highness most prudently considering, that as the barrenness and infertilitie thereof by want of diligence and industrie of men necessarily required for the amendment or maintenance of any ground, that shall bring foorth his fruit, breedeth as well scarcitie and lacke, of all maner of graine, grasse, wood, and other necessary things amongst his grace's subjects, the inhabitants of the said parishes, as also is the very originall mother and continuall nurse of dearth of things amongst his people dwelling in the confines of the same : even so the conversion thereof into tillage and severall pasture, by mens labour and pains, besides that it shall be an exile of idleness in those parts, must of necessitie cause and bring foorth to all his sayde subjects, plentie and aboundance of all things above remembered. And albeit his highness might justly by the ancient laws of this realme, approve to his owne peculiar profite and advantage a great part of the same waste and heath, neverthesse his majesty most graciously tendering more the common wealth of his subjects there, than the advancement of his owne commodity, hath not all onely already to his greate costs and charges, caused divers of his counsell and others of his officers and ministers by vertue of his graces commission in that behalfe to them directed, to repair thither to view, survey, and consider the said waste and heath, and thereupon to assigne out by metes and bounds to every of the said parishes, a convenient part and portion of the same, and out of those parts and portions by lotte, to appoint in severalltie to every inhabitant within the said parishes and hamlettes, such quantitie of the sayde heath as by the discretion of the said commissioners was thought meete and convenient, having a speciall regard to the number of the inhabitants in every parish, and to the number of acres of heath limited to every of the said hamlets and parishes, but also is contented and pleased at the humble petition and suit of his said subjects, to whom and other their posterity the commodity thereof shall specially redound, that it bee enacted by his highness as hereafter issueth.

Wherefore be it ordained, enacted, and established by the King, with the The

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assent of the lords spiritual and temporal, and the commons in this present parliament assembled, and by the authority of the same, that such part, and so much of the said wast and heath, whereof his grace is now seised, or at any time hereafter shall bee seised of one estate of inheritance, as shall be at any time hereafter by his graces commissioners or foure of them heretofore named or hereafter to be named, certified under their hands and seales into his highness' court of the augmentations of the revenues of his graces crowne, to be meete and convenient to be converted, used or occupied into tillage, pasture, meadow, or other severall ground, shall from henceforth immediately bee and remaine perpetually copihold land, and shall be deemed and adjudged of the nature, quality and condition of copyhold land, to all intents, constructions, and purposes. And that every tenant, inhabitant resiant, and other their heires, successors, assignes, and the heires, successors, and assignes of every of them, shall have and injoy such right, title, interest, possession, remainder, and reversion of and in the portion and part of the said wast and heath, to them or any of them by the said commissioners assigned, or to be assigned, as shall be by the said commissioners, or foure of them at the least, by copie to them, or any of them to bee had and made, declared or expressed : and the same shall be certified into the said court of augmentations, under their hands and seales.

And be it further enacted by the authoritie aforesaid, that all and every tenant, inhabitant, and resiant, and other above remembered, shall immediately after certificate made (as is aforesaid) be deemed, adjudged, and taken to be tenant by copie of court roll, of the part and portion to them, or any of them, (as is aforesaid) allotted and granted by copie of court roll, to such manor, or lordship, being within the said parishes and hamlets, or any of them, as the said commissioners, or foure of them at the least upon the said certificate, shall under their hands and seales, assign and appoint them, or any of them unto, and according to the tenour of the copie of court roll, to him or them made of the same. And that after assignment, and certificate made (as is aforesaid), the same partes and portions, shall be taken, had, and reputed to all intents, perpetually, as onely members and parcelles of the manor, or lordship, whereunto they are so appointed and assigned. And that the steward for the time being, of any such manors, or lordships, whereunto any part or portion of the said heath or wast, shall bee, by the said commissioners, or foure of them, assigned unto, shall after certificate thereof (as aforesaid) have full power and au-

thority from time to time, as the case shall justly require, to let and grant the same by copie of court roll, to any person or persons to hold the same partes and portions, according to the estate and interestes prescribed in their copies, at the will of the lord, according to the custome of the manor or lordship, whereunto the said partes and portions are (as is abovesaid, assigned or appointed to appertaine. And also, that all customs, usages, conditions, and ordinances which the said commissioners, or foure of them at the least, shall at any time hereafter prescribe, order, decree, or make, concerning any part or parcell of the said wast or heath, shali be as good, firme, and stable in the law, being certified under the hands and seals of the said commissioners, or foure of them at the least, into the said court (as is aforesaid) to all purposes and effects, as if they and every of them were particularly recited and enacted by authority of this parliament. Cu Or

Provided always, that if any such person or persons, to whom any part of the said wast and heath shall be allotted, do either refuse to take by copie of court roll, the part and portions to him allotted, assigned, or letten, or to be allotted, assigned, or letten, as is aforesaid, or else refuse to convert his said part or portion into tillage or pasture, and in such sort to improve the same, within such time as to him or them shall be prescribed or assigned, by the said commissioners, or foure of them at the least; that then such person and persons, as be or shall be tenant for terme of life, for terme of years, or at will, of such messuage, cotage, or land, in respect whereof the said part and portion is, or shall be allotted or assigned, shall and may take, have and receive, of the said stewards, the said part and portion of the said wast, to hold at the will of the lord, after the custome of the said manor or lordship, for term of one and twenty yeeres, the remainder thereof, after the end and determination of the said lease of twenty-one yeeres, to the owner of the said messuage, cotage, or lands, to hold to him, his heires, and assigns, at the will of the lord, after the custome of the said manor. Ti

And be it further enacted by the said authority, that if the said leasee refuse that to take (as is abovesaid) that then any other the king's subjects, borne under his grace's obedience, shall and may take, have, and receive the same part and portion of the said wast (as is abovesaid) for terme of one and twenty yeeres, with the like remainder to the said owner as is abovesaid. Le

Provided also, that all and every such leasee for terme of one and twenty yeeres (as is abovesaid) shall and may improve the said part and portion of the said wast and heath to him letten, by copie of court roll, during the said In

twenty-one yeeres, without any interruption of any owner of any such messuage, cotage, or land, any surrender, discharge, or determination, or forfeiture of his or their interest, estates, or termes of and in any such messuage, cotage, or land, notwithstanding.

The two acts of parliament last above extracted, are stated more for the purpose of shewing the sense the legislature entertained so long ago of the great advantage which would arise to the public by the cultivation of wastes, and extensive commons; and what the legislature had done to advance this, than as stating the general law in respect to inclosures; and because I have not observed these two acts relative to very extensive rights of the crown in very large and great wastes, near to the metropolis, capable of very great and perhaps very immediate improvement, have been taken notice of, for very great parts of these wastes remain uncultivated to this day.

I am not able to state with precision, what proceedings took place in consequence of these acts: but such examination seems to be a very proper subject of inquiry, and except that it may be wise to change the power of granting from a base tenure, as copyhold is, into freehold, which is ever the highest inducement to cultivation, it perhaps may not be difficult, should the legislature approve it, to form a mode of proceeding on these acts highly and quickly beneficial to the public.

The crown also, after the dissolution of the monasteries, became entitled to the possessions of the abbey of Chertsey, which adjoin the honour of Hampton Court; and in these possessions in the parishes of Chertsey and Egham, are very large, extensive, and valuable commons, all capable of inclosure, and very great improvements, and lying within twenty-three or twenty-four miles of London.

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All such barren heath or waste ground, other than such as be discharged of tithes by act of parliament, which before have paid no tithes by reason of barrenness, and shall be improved and converted into arable ground or meadow shall, after seven years after such improvement, pay tithe for the corn and hay growing upon the same.

If any such barren waste or heath ground, hath before this time been charged with tithes, and that the same be hereafter improved and converted into arable ground or meadow, the owners shall, during seven years after the improvement, pay such kind of tithe as was paid for the same before the improvement.

Confirms the statute of Merton 20th H. 3. c. 4th. and the statute of Westm. 2d. 13th Edw. 3d. chap. 46th, and enacts, that all such persons as shall bring assize upon any article of the above-mentioned statutes, shall, upon judgment for the plaintiff, have treble damages awarded to them. But this act shall not extend to houses heretofore built upon wastes or commons, not having above three acres of such waste or common ground belonging to them, nor to any garden, orchard, or pond there, not exceeding two acres; neither yet shall it cause any person to lose or forfeit any damage for the same, but such houses and grounds shall still stand and remain; howbeit the owners of such wastes or commons may lay open so much thereof as shall exceed three acres.

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And where one usurpeth common in the time that heirs are within age, or a woman is covert, or whilst the pasture is in the hands of tenants in dower, or of other particular estates, they who have such entry from time which the writ of Mordancester runneth, if they had no common before, shall have no recovery by writ of novel disseisin, if they be deforced.

After process of pone or attachment returned upon a writ of partition, affidavit being made of due notice given of the writ to the tenant to the action, and a copy thereof left with the occupier or tenant, or if they cannot be found, to the wife, son, or daughter (being of the age of twenty-one years) of the tenant, or to the tenant in possession, unless the tenant in possession be demandant in the action (at least forty days) before return of the pone or attachment, if the tenants to such writ, or any of them, or the true tenant to the lands, shall not within fifteen days after return of such pone or attachment cause an appearance to be entered, the demandant having entered his declaration, the court may proceed to examine the demandant's title and quantity of his purpart, and shall for so much give judgment by default, and award a writ to make partition, whereby such purpart may be set out severally; which being executed after eight days notice given to the occupier or tenants, and returned and final judgment entered, the same shall conclude all persons, although all persons concerned are not named in the proceedings, nor the title of the tenants truly set forth.

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Provided that if such tenant or person concerned shall, within one year after the first judgment entered, or in case of infancy, coverture, non sanz memoria, or absence out of the kingdom, within one year after their return, or the determination of such inability, apply to the court by motion, and shew a

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good and probable matter in bar of such partition, or that the demandant hath not title to so much as he hath so recovered, the court may suspend or set aside such judgment, and admit the tenant to appear and plead: and if the court upon hearing thereof shall adjudge for the first demandant, the first judgment shall stand confirmed against all persons, except such other persons as shall be absent or disabled; and the person so appealing shall be awarded to pay costs; or if within such time aforesaid the tenants or persons concerned, admitting the demandant's title and purparts, shall shew to the court any inequality in the partition, the court may award a new partition to be made in presence of all parties, if they will appear; which second partition returned and filed shall be good against all persons, except as before.

Sect. 3. No plea in abatement shall be received in any suit for partition, nor shall the same be abated by the death of any tenant.

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a of par- When the high sheriff, by reason of distance, infirmity, or other hindrance, cannot conveniently be present at the execution of any judgment in partition, the under sheriff, in presence of two justices of peace, may proceed to execution by inquisition; and the high sheriff thereupon shall make the same return as if he were personally present. And the tenants of the lands shall be tenants for such part set out severally to the respective owners, under the same rents and reservations; and the owners of the several purparts shall make good unto their respective tenants the said parts severally, as they were bound to do before partition made.

Sect. 5. The sheriffs, their under sheriffs and deputies, and in case of disability in the high sheriff, all justices of peace, shall give due attendance to the executing such writ of partition, (unless reasonable cause be shewn to the court upon oath) or otherwise be liable to pay unto the demandant such costs and damages as shall be awarded by the court, not exceeding £5, for which the demandant may bring his action in any of his majesty's courts at Westminster; and in case the demandant doth not agree to pay unto the sheriffs or under sheriffs, justices and jurors, such fees as they shall demand, the court shall award what each person shall receive, having respect to the distance of the place from their habitations, for which they may severally bring their actions.

Sect. 6. This act was to continue seven years, and is made perpetual, 3d and 4th Anne, c. 18.

As an instance of the very good purposes to which the inclosures of wastes

and commons have been and may be appropriated, not only for the benefit of the church and the public, but it is hoped equally beneficial to the poor, and as a precedent for the system, I beg leave, although only a local act, to state the following statute, viz.

It shall be lawful for any of the inhabitant: of any parish in the West Riding of the county of York, wherein any chapels of ease are or shall be erected, and wherein there are large wastes of commons, with the consent of the lords of the manor (and if there be above two lords, then with the consent of the major part of them) and with the consent of three parts of four of all who have right of common, according to their number and the value of their estates, to inclose any part of the wastes not exceeding sixty acres, or a sixth part of such common, where the sixth part shall not exceed sixty acres; and to settle the same in trustees for the benefit of such ministers as shall not have a settled provision of above £ 40 per annum, and shall reside within the parish or chapelry, and perform divine offices in the church or chapel there, according to the usage of the church of England, and be licensed by the archbishop.

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Saving unto all lords of manors and other proprietors of royalties all mines and quarries. Sect. 2.

It shall not be in the power of any trustee, minister, or any other person to alienate the profits of such inclosed lands to any other use. Sect. 3.

It shall be lawful for any of the trustees by writing, with the consent of the vicar or minister, being a party to and sealing such writing, to lease any waste grounds that shall be inclosed by virtue of this act, for any term of years not exceeding twenty one, so as there be reserved, payable half yearly, as much rent as can be gotten for the same, and that such rent be for the use of such vicar and minister, and their successors, and so as no fine be taken. Sect. 4.

All leases made of such inclosures in any other manner shall be void. Sect. 5.

Persons sued may plead the general issue, not guilty. Sect. 6.

This act shall be a public act. Sect. 7.

Where manors within the West Riding do belong to her majesty, with the consent of her majesty, and of three parts of four of the freeholders and others who have right of common there, according to their number and value, it shall be lawful to inclose any part of the waste, not exceeding *sixty acres*, or a *sixth part*, &c. and to settle the same for the charitable purposes aforementioned. Sect. 8.

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The preceding statements it is hoped will shew the common law, the statute law, and the sense the legislature has entertained from the earliest time to promote the cultivation and improvement of lands to be held in severalty; it must however be allowed, that there exist many adjudications less favourable to inclosures and improvements than those before stated; that this question has been a source of repeated contests, and that as the commons of this kingdom from the time of Henry 7. grew more opulent and powerful, the difficulties of approvement and inclosures became greater; so that for many years past the only mode pursued to make such improvements and inclosures effectual has been by obtaining special acts of parliament for these purposes. This practice however is much decreased and almost at a stand, from the very great expences attending such proceeding, and from the difficulties which arise in obtaining consents adequate to the rule laid down by parliament, from the obstinacy and perverseness of individuals having small property; the small cottagers becoming every day more and more unreasonable in their demands; and yet very great improvements remain to be made. In the above state of the common law and the statute laws on this subject, I may be thought to have been too prolix; but I trust I shall stand excused for entering into the subject so largely, when it is considered, that if the Board of Agriculture, upon their deliberations, should think fit to propose to the legislature any alteration of the laws in being, upon a general system, for obtaining inclosures of commonable lands, commons, and waste grounds, in an easier manner and at less expence than now practised, it is desireable, nay even necessary, that such plan and system should be as nearly accordant to the laws in being as may be, agreeing in the principle, but varying in the mode; so as to be carried more easily and effectually into execution.

There seems not a doubt, from what is before stated, but that under the common law, as well as under the several statutes above mentioned, the lord may approve, leaving sufficiency of common for those entitled to right of common; but the difficulty is how to ascertain that sufficiency of common; and this difficulty cannot be better shewn them, than by having stated, as above, several of the adjudged cases on this question. Both the common law, and the statute law establish writs of admeasurement of pasture, and of assize; and the statute of Westminster, the 2d and 13th of Edw. 1. chap. the 8th, gives treble damages on a second surcharge of pasture being found.

Various determinations also on this question appear heretofore to have been made in the courts of equity ; but from the difficulties and expence in such proceedings they have long been disused. I beg leave therefore to submit to consideration, whether it may not be a wise and salutary measure tending to inclosures, to propose an act of parliament agreeable to the principle of the old laws respecting surcharges of commons, and therein to ascertain and direct the proceedings to be had in this case ; and to empower the Lord Chancellor on the application of the lord of the soil, and of a fixed proportion in number and value of the landholders having right of common, in any commonable lands, commons, or waste lands in Great Britain, to issue a commission under the great seal, directing and authorizing three or five laymen and two clergymen of the same county, being qualified as directed by the act, with the powers usually assigned in the bills of inclosure lately passed, to inquire into the rights and claims of all persons having and claiming common of pasture and turbary within the commonable lands, commons, and waste lands within each respective township so applying, and to admeasure, settle, arbitrate and award to each person such their respective right and proportion, to be duly exercised and enjoyed. And in cases where disputes and questions shall arise, and the parties interested shall not submit to the arbitrement and award of the commissioners ; the commissioners in that case, at the request in writing of the parties not acquiescing in such determination, to direct their precept to the sheriff of the county, to summon a jury of the county (as convenient as may be to the place for which such commission shall be issued ; such jury being in no wise interested in the question) to try and determine the right disputed ; with such powers as may be thought proper to administer oaths, &c. to record all their proceedings, and file the same with the clerk of the peace for the county wherein such commons lie, and also to make a return into Chancery of such commission and all proceedings thereon ; giving an appeal to the Lord Chancellor, or to the judges in the Exchequer chamber, against such verdict and proceedings at any time within three months after the same shall be filed with the clerk of the peace of the county ; and that the Chancellor or the judges' decision thereon shall be final, unless forthwith appealed against to the House of Lords, the dernier resort.

It is further submitted, whether it may not be right to pursue a similar line in regard to divisions of commonable lands, commons, and waste lands, varying it only as the cases require ; that is, to pass an act of parliament to

impower the Lord Chancellor, on an application to his Lordship by the lord of the soil, and by a certain proportion of the number of landholders interested in the lands to be inclosed, and also a certain proportion in *value* of the estates having right of common thereon ; making the line of consent different in number in each of these cases, and not putting the consents conjointly, as a *majority in number and value*, as heretofore done ; from which the difficulties in obtaining inclosures have hitherto greatly arose ; the property and interest of each person so applying and consenting to such inclosure, within each such place, being respectively on such application verified on oath, as also the number of persons, and value of their property, who do not consent to an inclosure ; to issue out his summons to such persons so not consenting, to appear before him on a day to be appointed, to shew cause why such inclosure as prayed for may not be made ; and if on hearing the parties, he shall see just cause empowering him to issue a similar commission, to the one abovementioned, in cases for admeasurement of common, with all the powers usually given in inclosure bills, to divide and inclose the grounds so applied for to be divided, with the like proceedings, inrollments, and appeal, as above suggested ; and perhaps it would be best that one act be drawn to take in both cases.

This system would have the advantage of being accordant to the laws now in being, as well as agreeing with ancient practice ; only varying the mode of proceeding ; and it would enact a general law to have recourse to when parties shall think fit, without any compulsion that would be improper, directing, shortening, and simplifying the mode of proceeding, and reducing the expence attending the measure very greatly, when compared with the present practice of obtaining acts of parliament on each particular inclosure, which in controverted cases runs very high indeed ; and it preserves also the right of trial by juries, where demanded, with appeal to the courts of dernier resort. By this mode the expences in London to obtain such commission would be trifling ; as the first question upon issuing the commission would be heard before the Chancellor, on petition, accompanied with affidavits of the state of property, instead of as heretofore by the tedious proceeding by bill, answers, and decree ; and when the commission was granted, all the further proceedings would be by commissioners of the vicinage as arbitrators known to, and neighbours to all the parties, with a right of trial by jury if dissatisfied with their award, and an appeal also to the courts of dernier

resort ; avoiding the great expence that is now incurred from bringing witnesses, &c. to town, and detaining the parties there a long while ; as the chief expence would be in the country at some place near to the place in question ; and to keep this as low as possible, the allowance to the commissioners, clerks, surveyors, and persons to be employed might be limited in the act ; and the plan above suggested for obtaining at an easy expence a due admeasurement and ascertainment of the rights of common, to prevent abuses and surcharges, would operate also as a check on the perverseness and obstinacy of cottagers, and persons of small property, who now prevent such improvements. However, it is hoped these two measures would greatly contribute to promote and encourage inclosures and improvements ; for where an agreement cannot readily be brought about for dividing and inclosing waste ground, the enforcing a due admeasurement of pasture would bring forward such improvements by cutting off the various abuses of small landholders, and especially that very great one of taking in the cattle of strangers to depasture, under colour of their right, and receiving money therefore, in addition to their own cattle levant and couchant on their tenements. But should such system be adopted, it would be right that consideration should be had of the detriment this change in the mode of proceeding would be to certain officers of the two Houses of Parliament, who in the present mode of inclosures and improvements receive considerable advantages ; and it seems but just that they should have recompence, if the change should take place.

In North Britain, I believe, there is a short and very summary mode to compel divisions of property, and inclosures of wastes, by proceedings before the sheriff's depute, somewhat similar to the process here by writs of partition and division ; but as I am not sufficiently apprized of such proceedings, I barely mention the practice, without venturing to suggest that such proceedings could be applied to England. Should, however, the mode for encouraging and promoting inclosures above submitted to consideration be adopted, or any other mode fixed upon as better suited to this purpose, there remains a very great question to be provided for, and to be arranged ; and this is the tithes to attach on, and to be paid for the inclosure of commons and waste lands. Lands already cultivated, although enjoyed at certain seasons in common, having already paid tithes in kind, may be left on division and inclosure, as they now are ; unless some general arrangement can take

place with the owners and possessors of tithes, for the exoneration of all lands from tithe ; but in large extensive common pastures, at present only grazed by stint, by persons having certain common rights therein, and in large wastes or commons, some certain rule or composition for tithe seems requisite to be laid down and prescribed.

The legislature* by the 2d and 3d Edw. 6. chap. 13. sect. the 5th and 6th has in some manner shewn its sentiments on this point ; but in the questions that have arose on this statute, and the adjudications given thereon, this statute has been so construed as to give very little, if any, exemption or relief beyond lands covered with water, and quite unproductive, even of pasture for sheep ; so that this statute is scarce of any effect. In parishes and places wherein there are large tracts of waste ground, perhaps a mode of compensation for tithes might be arranged and brought about in a manner similar to what was done in three or four acts of parliament in the north of England, which I had the honour, now almost thirty years ago, to conduct through parliament, by giving to the church portions of the wastes inclosed, fully adequate to all the tithes of the respective parishes, the glebe lands, and the old inclosed lands, as well as of the wastes then to be inclosed ; and all tithes and demands of the clergymen whatsoever, except small offerings, which were left to remain ; and by inclosing these allotments at the expence of the respective parishes, by which measure the livings were very soon greatly increased, and now remain of much greater value. The objection of lands being held in mortmain by the church seems done away, as all lands now held by the church are contributory to the public exigencies, in like manner as any other land in the kingdom ; and it is hoped such means might be adopted in the act of parliament, for giving a compensation for

* 2 Inst. 655. although it doth yield some fruit, and do pay tithes for wool and lamb, or the like, yet if it be barren land as to agriculture or tillage, which this statute meant to advance, it is within this act : but yet if the ground be not apt for tillage, yet *if it be not of its own nature barren, it is not within this act.* As if a wood be stubbed and grubbed, and made fit for the plough, and employed thereunto, yet it shall pay tithes *presently* ; for wood ground is fertile, and not barren.

2 Inst. 656. Bunb. 159. In the case of Stockwell and Terry, July 14, 1748, it was held by Lord Hardwicke, that such land only is within this statute as above the necessary expence of inclosing and clearing, requires also expence in manuring before it can be made proper for agriculture ; and he decreed tithe to be paid on its being proved, that the land bore better corn than the arable land in the parish without any extraordinary expence of manure.

tithes, by inclosing the lands so to be given, and building farm houses and offices thereon at the expence of the parish inclosing, proportionable to the quantity of the land given, as would be very beneficial to the church, and to the possessors of tithes, and as may induce them to consent to an act to regulate the compensation to be paid for tithes on inclosures of commons and waste lands; and perhaps also for the extinguishment of all tithes in such parishes, on a plan similar to the cases above stated. Such measure, however, will require very great deliberation, and conferences with the prelates of the realm, and the lay impropiators holding tithes; and if this, or some other plan for this purpose, can be effected in respect to commons, commonable pastures, and waste grounds, it would perhaps tend to bring forward some general arrangement for the extinction of tithes, which, it is hoped, would ultimately be of real advantage to the church, as well as greatly tend to the increase of agriculture and improvements.

Having stated the ideas which have occurred to me on the subject of inclosures and improvements of commonable lands, commons, and waste ground, towards bringing such into cultivation; I beg leave to proceed to another part of the second head, viz. What laws have been passed for the purpose of preserving timber trees, woods, and underwoods; or for the encouragement of planting on commons or waste ground: which stand in our statute books as follows.

In all coppice-woods, or underwoods, which shall be felled at fourteen years growing, or under, there shall be left standing for every acre twelve standils or storers of oaks; if there be not so many of oak, there shall be left so many of other kind, viz. of elm, ash, aspe, or beech, as shall make up the number likely to be timber trees; the same standils to be of such standils or storers as have been left there at any felling of the same underwoods in times past; and the stores so left shall be preserved till they be ten inches square within three feet of the ground, upon pain that every owner having an estate in the ground causing any such underwoods to be felled, and not leaving the said storers, to forfeit for every standil so not left, 3s. 4d. the one half to the king, and the other half to the party that will sue, &c.

35 Henry chap. 17. number of to be left ting wood

All underwoods which shall be cut down at the age of fourteen years from the 20th of April next after the felling thereof, during four years, shall be inclosed, or the springs thereof otherwise preserved from cattle, by them which shall have possession in the woods, upon pain to forfeit for every rood

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3s. 4d. for every month. And all underwoods which shall be so felled, being *above fourteen years growth, and not above twenty-four years from the 20th of April next after the felling*, during six years, shall be inclosed, or the springs thereof otherwise preserved from cattle, at the costs of such which shall have interest in the woods; upon pain to forfeit for every rood 3s. 4d. for every month.

No person shall convert into pasture or tillage any such underwoods containing two acres or above, which now be wood, and reserved to the use of increase of wood or underwood, and being two furlongs distant from the house of the owner, or from the house whereunto the said wood doth lie; upon pain to forfeit for every acre 40s.

This act not to extend to any coppice-woods, or underwoods, destroyed or turned into tillage or pasture within 20 years last past, although the more part or any part thereof be now overgrown with bushes or underwood.

All persons which shall have any several woods growing with great trees *above 24 years growth, shall at felling or weeding thereof, leave standing for every acre 12 trees of oak of the same great trees*, if there be so many there; and for lack of oaks, as many other trees of elm, ash, beech, or aspe, as shall make the full number, the same to be preserved *during 20 years* next after the felling, and also from the 20th day of April next after the felling thereof during *seven years* sufficiently inclose them, or the springs thereof otherwise preserve from cattle; upon pain to forfeit for every such great tree lacking, 6s. 8d. and upon pain to forfeit for every rood not inclosed or preserved, for every month 3s. 4d.

Provided that it shall be lawful to every owner of the said woods, &c. to sell the same for building, repairing, and inclosing of houses, orchards, and gardens, and for inclosing of parks, chases, or other grounds, and for making or repairing of water-works, bridges, flood-gates, making or amending of ships and other vessels, *and for all other things concerning their own affairs, as they might have done before this act.*

It shall not be lawful to any person which shall have any woods or underwoods, wherein any other persons have used time out of remembrance to have common of pasture, to sell the said woods (except it be to his own use) until the fourth part of such woods, or as much as the fourth part shall amount unto, be set out and inclosed, viz. the owner of the soil shall call together the commoners, or the more part of them, and by the assent of the

more part of them shall set out the fourth part ; and if the lord and tenants do not agree, then two justices of peace, not being of the alliance, counsel, or fee of the owner, being thereunto appointed by the justices in their quarter-sessions, upon request made by the owner, shall have power to call before them, upon such penalties as the justices shall appoint, twelve of the commoners and inhabitants ; and upon the appearance of the owners, &c. or the more part of them, the justices shall declare the cause of their appearance, and shall by their assent proceed to the severing of the said fourth part, and if the justices, owners, commoners, and inhabitants cannot agree, the justices shall have power to set out by mete and bound the fourth part, or so much under the fourth part of the said woods as shall by the justices be thought necessary ; and within the month after such severance the owner of the woods shall inclose the same, and after such inclosure, the said owner may fell the woods.

Provided that there shall be left standing upon the part so severed like number of standils or storers of young oaks, or other young trees of elm, ash, aspe, or beech, if it be underwoods ; and if the woods shall be great trees, then such number shall be left standing of great trees, and upon like penalties as before limited ; and the part so severed shall be inclosed seven years, in like manner and upon the like penalties as before limited ; and the standils, storers, and great trees, appointed to be left standing shall be preserved. And no beasts during seven years after the felling of the woods shall willingly be put in or suffered to feed in any parcel of such part so set forth, upon pain of 4*d.* for every beast.

Sect. 31
Standils &
to be pre

If any owner of such woods in any waste ground cut down any trees contrary to the form aforesaid, every person so offending shall forfeit for every tree 6*s.* 8*d.* ; one half of the said forfeitures to be to the king, and the other moiety to such person that will sue, &c.

Sect.
Penalty of
felling in

The commoners may use their common for their cattle within the residue of the woods not inclosed, as if this act had never been : and the owner of the soil shall be excluded to put any cattle in the same residue, or to take any profit of the pasture upon the same, during the seven years ; and after the seven years expired, until the next cutting down of the woods upon the part severed, as well the same part as the residue shall be used in common, as well by the lord as by the commoners.

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Common
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Provided it shall be lawful to fell and inclose all woods and underwoods in

Sect.
Grounds
wood may

waste grounds which have been used to be inclosed for the maintenance of wood.

Section 12.
Inclosed part if not
felled to be com-
mon.

If the part of wood so inclosed be not felled within four months after the inclosing, it shall be lawful to the commoners to put their cattle into the ground so inclosed, as long as the wood shall be unfelled.

Sect. 13.
Exceptions.

This act shall not extend to any owner of woods within the weilds of Kent, Surrey, and Sussex, other than to common woods within the said weilds.

Sect. 15.

This act shall not charge any person with any penalty for any timber trees growing within two miles of the sea in Cornwall, or any other timber tree being sear and dead in the tops, or any other timber trees to be taken by the king's commission, or for any offence, unless the person offending be sued within one year after the offence committed.

Section 16.
Penalty of breaking
fences of woods.

If any person break or destroy any fences made for the saving of the same woods, he shall forfeit 10s.

Sect. 17.
Swine not to go
unringed in
woods inclosed.

If any person suffer his swine of the age of ten weeks, during such years as the woods be appointed to be inclosed, to go in any grounds or woods, unless the swine be ringed or pegged, the owners of such swine shall forfeit for every swine 4d. the one half, if it be in the king's woods, to be to his highness, and the other to the finder; and if it be within any other person's grounds, the one half to be to the owner of the soil, and the other part to him that will sue, &c.

Sect. 18th.
Woods in parks.

Where any woods shall be felled in any park, or ground inclosed wherein deer shall be kept, the owners of such parks, &c. shall be chargeable for the inclosure and preservation of the same, but for four years after such felling.

Section. 19.
Where the inclo-
sures are broken,
penalties to be le-
vied on the break-
ers.

If the inclosure of any of the said woods be broken down against the will of the owner, whereby cattle escape and hurt the spring, or if the woods be by any means destroyed or hindered, without the assent of such owners, the penalties shall be extended upon the persons by whose default the wood shall be so destroyed, &c. and not upon the owner.

Section 20.
After 2 years,
owners may put
colts and calves
into inclosed
woods.

It shall be lawful for every owner of the said woods, underwoods, grounds, and coppice, after the same have been fenced, or the spring otherwise preserved two years, to put colts and calves under the age of one year, into the grounds.

Revived and made perpetual by 13th Eliz. cap. 25th. s. 3.

1st and 2nd Philip
and Mary, chap.
1th. Wood not to
be exported with-
out license.

If any person or persons, after the 20th day of January next ensuing, do carry and convey away by boat, crayer, or other vessel, or otherwise, any wood,

among other things, to any ship or vessel being on the seas, or within any haven, creek, or other place of the border of this realm, to be transported, carried, and conveyed into any place in the parts beyond the seas, or into the realm of Scotland, without sufficient authority so to do, every owner of the said wood, or other things mentioned in the said act, so transported or carried shall forfeit double the value of the same; and the owner and owners of the said ships, and other vessels, shall forfeit the said ships, crayers, and other vessels, with all their apparels, to them, and every of them belonging, wherein the said wood or other things mentioned in the said act shall be so transported and carried; and the master and mariners of every of the said ships, crayers, and vessels, for every such offence shall forfeit all their goods, and be imprisoned by the space of one whole year, without bail or mainprise; the one moiety of all and every such forfeiture and forfeitures to be to the king and queen's highness, &c. and the other moiety to him or them that will sue for the same.

No person shall convert to fuel for the making of iron any timber trees of oak, beech, or ash, or any part thereof, of the breadth of one foot square at the stub, and growing within fourteen miles of the sea, or of the rivers of Thames, Severn, Wye, Humber, Dee, Tyne, Teese, Trent, or any other river by which carriage is used by boat to the sea, upon pain of forfeiture for every tree or part thereof so employed 40s. one half to the queen, and the other moiety to him that will sue.

Stat. 1
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Timb
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This act shall not extend to the county of Sussex, nor to the weild of Kent, nor to the parishes of Charewood, Newdigate, and Leigh, in the weild of Surrey.

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All woods or coppices, intended by 35th Hen. 8. c. 17. to be inclosed, shall be sufficiently inclosed, or the springs thereof otherwise saved, two full years more than in the said act is limited, upon like pains as are contained in the said act; and it shall not be lawful to put any cattle into any coppice woods inclosed, from the time of the sale unto the end of five years, nor from the end of five years any other cattle but calves and yearling colts, until the end of six years, if the wood was under the age of fourteen years at the last fall, or until eight years, if the wood was above the age of fourteen at the last fall.

13th E
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No person shall convert to fuel for the making of iron in any iron-mills, furnace, or hammer, any wood or underwood which shall grow within twenty-

Stat. :
chap.
Wood

two miles from London, or within twenty-two miles of the Thames, from Dorchester in the county of Oxford downwards, or within four miles of the foot of the hills called the Downes, betwixt Arundel and Pemsey in Sussex, nor within four miles of Winchelsey and Rye, nor within two miles of the town of Pemsey, nor within three miles of Hastings, upon pain to forfeit for every load 40s. one half to the queen, and the other moiety to him that will sue.

This act shall not extend to any woods in any such part of the weilds of Surrey, Sussex, or Kent, as is distant above eighteen miles from London, and eight miles from the Thames.

No new iron works shall be erected within twenty-two miles of London, nor within fourteen miles of the Thames, nor within four miles of the Downes, or of the towns of Pemsey, Winchelsey, Hastings, or Rye, upon pain of £ 100, to be recovered as aforesaid.

This act shall not extend to any woods upon any lands of Christopher Darrel, in the parish of Newdigate, within the weild of Surrey, which have been coppiced for the use of his iron works.

No person shall set up within the ccunties of Sussex, Surrey, or Kent, any iron-mills, furnace, finery, or blomary, for the making or working of iron, other than upon such former bays or pens, whereupon hath been or shall be standing some iron-mills, furnace, or hammer, or else upon such lands as the party shall furnish the same with sufficient supply of his own woods, being to him in fee, or for life without impeachment of waste; nor shall convert to fuel for the making or working of iron, in any iron-mills, &c. the bodies of any sound timber trees, apt for the making of cleft wares, or sawing timber of oak, ash, or elm, of the bigness of one foot square at the stub, or any part of the same, upon pain of forfeiture for every iron-mill, &c. £ 300, and for every body of such timber tree 40s. one half of which forfeitures to be to the queen, and the other half to him that will sue.

It shall be lawful for the owners of such trees, the bodies whereof shall be employed for timber or cleft ware, within the weilds of Sussex, Surrey, or Kent, the same not being within eighteen miles of London, or eight of the Thames, or four miles of the towns of Rye, Winchelsey, or three miles of Hastings, or four miles of the foot of the Downes, between Arundel and Pemsey in Sussex, to employ the tops and offals for fuel for iron works.

Upon a perusal of the several acts of Parliament last above stated, relative to the growth, protection, and preservation of woods, it will appear that they are ineffectual for the purposes proposed ; the statute of the 35th of Henry 8. chap. 17. by several of the exceptions and provisions contained therein, evidently counteracts other parts of that law, and the time of fence fixed for the coppices and the growth of timber is totally inadequate to the preservation of young wood, since nothing can be more fatal and destructive to the growth of wood, than the permission given by section the 20th of this statute, to put young colts and calves into the woods after being otherwise two years preserved. The legislature seems afterwards to have been apprized of this by passing the statute of the 13th of Elizabeth ; but even the times of fence of coppice so enlarged by that statute are inadequate to preserve the growth of wood and timber to good effect.

The 1st, 2d, 5th, and 8th sections of the act of the 35th Hen. 8. seem to be adapted solely to the regulation of coppices and woods of private persons. The 3d and 4th sections are very material for the preservation of woodlands ; but for public advantage the provisions seem not to have been attended to for many years at least, if ever enforced. And the 6th section leaving persons to cut and manage their woods and coppices as they please for their own uses, counteracts the prior regulations. Sections 7th, 8th, 9th, 10th, 11th, and 12th, appear to have been enacted at a time when timber and wood was growing upon the wastes and lands subject to common of pasture ; but timber so growing on wastes scarce now exists any where in England, except in his Majesty's forests ; and consequently all the regulations in this act are now without effect.

Query if
section.

Sections 13th and 15th are exemptions to particular places from the provisions of the act ; and

Sections the 16th 17th and 19th relate to the breaking down the fences of woods, and permitting swine to go in the woods, not being ringed or pegged, and seem very proper to be attentively considered, amended, and enforced, as the penalties are not adequate to the damage done ; and as permitting swine to go into woods and coppices, is the destruction of the growth of wood from acorns. The same observations arise on a perusal of the act of the 1st and 2d of Philip and Mary, chap. 5th, the 5th of Eliz. chap. 15th. section the 5th, the 13th of Eliz. chap. 25. section 18th, the 23d of Eliz. chap. 5th, section the 1st, the 27th of Eliz. chap 19. section 1st, and upon a perusal

and due consideration of the above stated acts in being for the growth and preservation of wood, it is apprehended it will appear to be essential to the public service, to reduce these laws into one act of parliament, with some general regulations for the management of woods, the cutting of coppices, and the extension of the *times of fence* of all coppices and woods to a longer term than is by these acts enacted, where coppices and woods are subject to be laid open to rights of common, woods and coppices of private persons not liable to be so laid open, will not require the same regulations, should it be thought prudent to make any regulations respecting such private property, on the plea of public service; because underwood is now become of so great a value, that the proprietors of such woods and coppices will take care to keep such in due fence, as he will be enabled to cut down his coppices of underwood so much sooner, but if any regulations are thought right to be made on such cases for the advantage of this country, as a naval power, it may be right to amend and enforce the act of Henry the 8th in respect to the number of tillers or standils to be left to grow to timber, at each cutting respectively of such woods and coppices, and for how many cuttings; and when such timber so preserved comes to be fit to cut down, to enact the mode of cutting such reserved timber in succession, according to the years it has stood. And as the growth of large oak timber, especially such timber as is fit for naval purposes, militates against the growth of underwood; and that by cutting timber for common ordinary uses at an earlier period than when fit for the navy, such timber yields more profit to the proprietor, than when it was let stand for naval use; it seems worthy of consideration whether it may not be advisable to give some premium over and above the full price per load (then in course of payment) for all timber of large meetings fit and proper for naval purposes delivered into his Majesty's navy yards. Some such regulation it is hoped would induce private persons having woodlands to grow and protect large timber, otherwise, where the advantage arising from more frequent cuttings of timber preponderates so much, it is to be apprehended much oak timber will not hereafter be grown to a large size, except for beauty, which is only occasionally; and timber of that sort, which is now growing will, it is feared, too quickly decrease.

Under this head also it seems proper to class the laws which have been made to protect woods and coppices, and to punish woodstealers, and offences committed thereon; which I find in our statute books as follows;

Every constable or other person shall have power to apprehend all persons they shall suspect, having or carrying any burden of wood, bark, or bast, of any trees, or any gates, stiles, posts, pales, rails, or hedge-wood, broom, or furze, and by warrant of one justice of peace any officer shall have power to search the houses or other places of all persons they shall suspect to have any wood, poles, young trees, or bark, or bast of trees, or any gates, &c. and where they shall find any such, to apprehend all persons suspected for taking the same, and them to carry before a justice of peace; and if they do not give a good account how they came by such wood, &c. or shall not within some convenient time, to be set by the justice, produce the party of whom they bought the same, or some witness to depose such sale of the wood, &c. they shall be convicted of the offence of cutting and spoiling of the same woods, &c. within the statute 43d Eliz. chap. 7th, viz.

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All lewd persons which shall cut or unlawfully take away any corn growing, or rob any orchards or gardens, or break or cut any hedge, pales, rails or fence, or dig, pull up, or take up, any fruit-trees to the intent to take the same away, or shall cut or spoil any woods or underwoods, poles or trees standing, not being felony, and their procurers or receivers knowing the same, being convicted by confessions or one witness, before some justice of peace, mayor, or other head officer where the offence shall be committed, or the party apprehended, shall give such recompence for the damages as by such head officer or justice of peace shall be appointed, for the first fault; and if such offenders shall be thought in the discretion of justice, &c. not l'able, or do not make satisfaction for the damages, the justice, &c. shall commit the offenders to some constable or other inferior officers of the city, &c. or hamlet where the offence shall be committed, or the party apprehended, to be whipped; and for every such offence for which the offenders shall be eftsoons committed, to receive the said punishment of whipping.

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If any constable or inferior officer do not, at the command of any justice of peace, or other head officer, execute by himself, or some other, the punishment limited by this statute, it shall be lawful for the justice to commit the constable, &c. to the common goal, until the offenders be by the said constable, or by his procurement, whipped.

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Every person convicted shall for the first offence give the owner such damages as the justice shall appoint, and pay down to the overseers of the poor such sum, not exceeding 10s. as the justice shall think meet; and if such

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offender do not make satisfaction to the owner, and pay to the poor in manner aforesaid, the justice shall commit him to the house of correction, not exceeding one month, or to be whipped by the constable. And if such person shall again commit the said offence, and be convicted, he shall be sent to the house of correction for one month, and kept to hard labour. And if such person shall again commit the said offence, and be convicted the third time, he shall be deemed an incorrigible rogue.

4. in buyers.

Whosoever shall buy any burdens of wood, poles, or sticks, which may be justly suspected to have been unlawfully come by, it shall be lawful for one justice, upon complaint, to examine the matter upon oath, and if they find that the same was bought of a person who might justly be suspected to have unlawfully come by the same, and that the same was unlawfully come by, the justice shall award the party to pay treble the value to the party from whom the same was unlawfully taken; and in default of present payment, to issue warrants to levy the same by distress and sale of goods; and in default of distress, to commit the party to gaol, there to remain one month.

5.

No person shall be questioned for any offence upon this law, that hath been punished for the same by any former law, nor unless he be questioned within six weeks after the offence.

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If any shall maliciously break down, cut up, bark, destroy, or spoil, any timber tree, fruit tree, or other tree, the person damaged shall receive such satisfaction from the inhabitants of the parish, town, hamlet, vill, or place, to be viewed, and costs to be recovered in the same manner as hedges overthrown in the night, by 13th Edw. 1st. chap. 46th. See Approvement. And where such offence shall be committed in Scotland, to be recovered by way of summar action, as damages in other cases of riot; unless the party offending shall by such parish, &c. be convicted of such offence within six months.

2. sent of

Any two justices of the county, &c. or the justices in sessions, on complaint by any inhabitant of such parish, &c. or the owner of the trees, or of any other, may cause such offender to be apprehended, and hear and determine the offences aforesaid, and on conviction of such offender, shall commit him to the house of correction, to be kept to hard labour for three months; and where there are no houses of correction, the justices shall commit him to prison for four months, and shall also order that such offender be publicly whipped by the master of such house of correction, once every month during such three months, in such borough or corporation, if the offence be com-

mitted therein, or in the market-town where such house of correction stands, or in the next market-town in the county, on the market day, between the hours of eleven and two; and where there is no house of correction, the justices shall order such offender to be whipped by the hangman, once every month during such four months, on the market day where such offender shall be committed, or on the market day of some town, between the hours aforesaid.

Before such offender be discharged, he shall find sureties for his good behaviour for two years.

Sec

If any person shall maliciously set on fire, burn, or cause to be burnt, any wood, underwood, or coppice, such malicious setting on fire is made felony; and where such offences are committed in Scotland, the offenders shall suffer as wilful fireraisers, according to 7th Ann. cap. 21st.

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felony.

If any person shall either by day or by night cut, destroy, bark, deface, spoil, or carry away, any wood, springs, trees, poles, woods, tops of trees, underwoods, or coppice woods, thorns, or quicksets, without consent of the owner, or shall break open, throw down, or destroy any hedges, gates, posts, stiles, fences, ditches, or other inclosures of such woods, wood grounds, parks, chases or coppices, plantation or trees, thorns or quicksets, the lords of manors or owners who shall be damaged thereby, shall have such remedy from the inhabitants of the parishes, towns, hamlets, villages, or places joining to such wood springs, &c. as for hedges overthrown in the night, by 13th Edw. 1st. chap. 46th. (which see in Approvement, unless the offender shall by such parish, &c. be convicted of such offence within six months.

6th Geo.
16th. sec
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If any person in a riotous, open, tumultuous, or in a secret and clandestine manner, wrongfully and maliciously shall cut down, destroy, burn, carry away, &c. any wood, or springs of woods, &c. or shall in such riotous, &c. manner, maliciously break open, throw down, or destroy, any hedges, gates, posts, or other inclosures of such woods, &c. any two justices of peace, or the justices in sessions, upon complaint made by any inhabitant or other, may cause the offender to be apprehended, and hear and determine such offence; and if such justices shall convict any person of the trespasses aforesaid, they shall inflict the penalties in 13th Edw. 1st. chap. 46.

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If any action be prosecuted for any thing done in pursuance of this act, or 1st Geo. 1st. chap. 48. the defendant may plead the general issue, &c. and recover treble costs.

Sec

If any persons being armed with swords, fire arms, or other offensive wea-

9th Geo.
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the black pons, and having their faces blacked, or being otherwise disguised, shall appear in any forest, chase, park, paddock, or grounds inclosed, and shall, among other things, cut down or destroy any trees planted in any avenue, or growing in any orchard, garden, or plantation, for ornament, shelter, or profit; or shall set fire to any house, barn, or out-house, or to any hovel, cock, snow, or stack of corn, straw, hay, or wood; every person so offending, being convicted, shall be guilty of felony, and shall suffer death without benefit of clergy.

Geo. 2. c. 19. Enacts that if any person or persons not having right or legal license to do the same, shall at any time after the first day of August, one thousand seven hundred and fifty-five, set fire to, burn, or destroy, or shall abet, aid or assist in, or at the burning or destroying any goss, furze, or fern, growing or being in or upon any forest or chase within that part of Great Britain called England, without the license or consent of the owner or proprietor, or the person chiefly intrusted with the care, oversight, and custody of such forest or chase, or some part thereof, and being brought before one or more justice or justices of the peace for the county, riding, division, or place, where such forest or chase shall lie, and shall be thereof convicted by confession, or upon oath of one or more credible witness or witnesses (which oath such justice or justices is and are hereby empowered to administer) or upon the view of such justice or justices, every such person or persons being so convicted shall for every such offence forfeit and pay any sum not exceeding five pounds, nor less than forty shillings, one moiety thereof to the informer, and the other moiety to the use of the poor of the parish where the offence shall be committed; which penalty, in case the same be not forthwith paid, shall and may be levied by distress and sale of the offender's goods and chattels, by warrant or warrants under the hand and seal or hands and seals of such justice or justices; and in case no sufficient distress can be found, then it shall and may be lawful for such justice or justices to commit such offender or offenders to the common gaol of the county or place where such offence shall be committed, for any time not exceeding three months, nor less than one month.*

Geo. 2. chap.
4. N. B.
goes to di-
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shall be taxable: not necessary to state.
Geo. 3. chap. 2. sect. 38. N. B. This also only goes to direct how rates upon woodlands may be

Recites, that the laws in being have been found ineffectual for preventing the destruction of timber trees and other trees, underwood and covert growing upon the forest and chases within this kingdom; and enacts that from and after the passing of this act, it shall and may be lawful for every surveyor of his Majesty's woods, and his lawful deputy, and also for the officers and keepers of any forest or chase, to seize and take away for his and their own use, any saw, axe, hatchet, bill-hook, or other instrument, used by any person or persons, whom they shall find unlawfully stocking up, sawing, cutting down, topping, lopping, or destroying any timber tree, or other tree, underwood or covert, within such forest or chase.

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Enacts, that from and after the second day of June, one thousand seven hundred and sixty-six, all and every person and persons, who shall in the night time, lop, top, cut down, break, throw down, bark, burn, or otherwise spoil or destroy, or carry away any oak, beech, ash, elm, fir, chesnut, or asp, timber tree, or other tree or trees standing for timber, or likely to become timber, without the consent of the owner or owners thereof first had and obtained; or shall in the night time pluck up, dig up, break, spoil, or destroy, or carry away any root, shrub, or plant, roots, shrubs, or plants, of the value of five shillings, and which shall be growing, standing, or being, in the garden ground, nursery ground, or other inclosed ground, of any person or persons whomsoever, shall be deemed and construed to be guilty of felony; and every such person or persons shall be subject and liable to the like pains and penalties as in cases of felony; and the court, by, and before whom such person or persons shall be tried, shall and hereby have authority to transport such person or persons for the space of seven years, to any of his Majesty's plantations in America, in like manner as other felons are directed to be transported by the laws and statutes of this realm: and all and every person and persons who shall be wilfully aiding, abetting or assisting, in such cutting down, breaking, throwing down, barking, burning, or otherwise spoiling, or destroying, or carrying away, any such oak, beech, ash, elm, fir, chesnut, or asp, timber tree, or other tree or trees standing for timber, or likely to become timber, as aforesaid; or in such plucking up, digging up, cutting, breaking, spoiling, or destroying, or carrying away, such root, shrub, or plant, roots, shrubs, or plants, as aforesaid, of the value aforesaid; or who shall buy, or receive such root, shrub, or plant, roots, shrubs, or plants, of the value aforesaid, knowing the same to be stolen, shall be subject and liable

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3. chap.
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Enacts, that from and after the twenty-fourth day of June, one thousand seven hundred and sixty-six, every person who shall wilfully cut or break down, bark, burn, pluck up, lop, top, crop, or otherwise deface, damage, spoil, or destroy, or carry away, any timber tree or trees, or trees likely to become timber, or any part thereof, or the lops, or tops thereof, without the consent of the owner or owners thereof first had and obtained, or in any of his Majesty's forests or chases, without the consent of the surveyor or surveyors, or his or their deputy or deputies, or person or persons intrusted with the care of the same, and shall be thereof convicted upon the oath of one or more credible witness or witnesses, before any one or more of his Majesty's justices of the peace for the county, &c. or place, wherein such offence shall have been committed, shall, for the first offence, forfeit and pay such sum of money, not exceeding twenty pounds, as to such justice or justices shall seem meet, together with the charges previous to and attending such conviction, to be ascertained by such justice or justices who shall convict the offender; and upon non-payment thereof, such justice or justices shall commit the offender to the common gaol of the county or place where the offence shall be committed, there to remain without bail or mainprise for any time not exceeding twelve months, nor less than six months, or until the penalty and charges shall be paid; and if any person so convicted shall be guilty of the like offence a second time, and shall be thereof convicted in like manner, such person shall forfeit and pay such sum of money, not exceeding thirty pounds, as to such justice or justices shall seem meet, together with the charges previous to and attending such conviction, to be ascertained by such justice or justices who shall convict the offender; and upon non-payment thereof, such justice or justices shall commit the offender to the common gaol of the county or place where the offence shall be committed, there to remain without bail or mainprise for any time not exceeding eighteen months, nor less than twelve months, or until the penalty and charges shall be paid: and if any person so convicted shall be guilty of the like offence a third time, and shall be thereof convicted in like manner, such person shall be deemed guilty of felony, and the court by and before whom such person shall be tried, shall and hereby hath authority to transport such person or persons for the space of seven years, to any of his Majesty's plantations in America,

in like manner as other felons are directed to be transported by the laws and statutes of this realm.

That all oak, beech, chesnut, walnut, ash, elm, cedar, fir, asp, lime, sycamore, and birch trees, shall be deemed and taken to be timber trees, within the true meaning and provision of this act.

That from and after the twenty-fourth day of June, one thousand seven hundred and sixty-six, all and every person who shall pluck up, or cut, spoil, or destroy, or take, or carry away, any root, shrub, or plant; roots, shrubs, or plants, out of the fields, nurseries, gardens, or garden grounds, or other cultivated lands, of any person or persons whomsoever, without the consent of the owner or owners thereof first had and obtained, and shall be thereof convicted upon the oath of one or more credible witness or witnesses, before any one or more justice or justices of the peace for the county, &c. or place wherein such offence shall have been committed, shall for the first offence forfeit and pay such sum or sums of money as to such justice or justices shall seem meet, not exceeding forty shillings, together with the charges previous to and attending such conviction; to be ascertained by such justice or justices who shall convict the said offender; and if any person so convicted shall again commit the like offence, and shall be thereof convicted in manner aforesaid, such person and persons being so convicted, shall, for such second offence, forfeit and pay such sum of money as to the said justice or justices shall seem meet, not exceeding five pounds, together with the charges previous to and attending the conviction of such offender; and if any person so before convicted, shall a third time commit the like offence, and shall be thereof convicted, such person so convicted shall for such third offence be deemed guilty of felony, and the court before whom such person shall be tried, shall and hereby hath authority to transport such person for the space of seven years, to any of his Majesty's plantations in America, in like manner as other felons are directed to be transported, by the laws and statutes of this realm.

That all and every person and persons, who from and after the twenty-fourth day of June, one thousand seven hundred and sixty-six, shall go into the woods, underwoods, or wood-grounds, of any of his Majesty's subjects, not being the lawful owner or owners thereof, and shall there cut, lop, top, or spoil, split down, or damage, or otherwise destroy, any kind of wood, or

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Act. 5.
Justices of
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may administer
this act in
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Act. 6.
If the forfei-
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underwood, poles, sticks of wood, green stubs, or young trees, or carry, or convey away the same, or shall have in his, her, or their custody, any kind of wood, underwood, poles, sticks of wood, green stubs, or young trees, and shall not give a satisfactory account how he, she, or they came by the same, and shall be thereof convicted before any one or more of his said Majesty's justices of the peace, on the oath of one or more credible witness or witnesses, shall for the first offence forfeit and pay immediately on conviction, any sum not exceeding the sum of forty shillings, together with the charges previous to and attending such conviction, to be ascertained by the said justice or justices who shall convict the offender or offenders; and if any person or persons shall commit any of the offences aforesaid a second time, and shall be thereof again convicted in manner aforesaid, he, she, or they shall forfeit and pay any sum not exceeding the sum of five pounds, together with the charges previous to, and attending such conviction, to be ascertained as aforesaid; and if any person or persons shall commit any of the offences aforesaid a third time, that then such person and persons, being duly convicted thereof according to law, shall be deemed and adjudged an incorrigible rogue, or rogues, and shall be punished as such.

That his Majesty's justices of the peace for the respective counties, &c. or places, wherein any of the offences committed against this act shall be done, are hereby authorized to put this act in execution, and to administer an oath to any such credible witness or witnesses.

That it shall and may be lawful for such justice or justices, unless the respective forfeitures shall be paid down upon conviction forthwith, where not otherwise directed by this act, by warrant under his or their hands and seals to commit such offender or offenders, for the first offence, to the house of correction for one month, to hard labour, and to be once whipped there; and for the second offence, where not otherwise directed by this act, to the house of correction for three months, to hard labour, and to be whipped there once in every one of the said three months.

That if any person or persons shall hinder,* or attempt to prevent the seizing or securing any person employed in carrying away any such timber,

* Sect. 7. Persons hindering or attempting to prevent seizing offenders, to forfeit £10 to the persons convicting them.

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Which said conviction* shall be good and effectual in law to all intents and purposes, and shall not be quashed, set aside, or adjudged void or insufficient for want of any form or words whatsoever, nor be liable to be removed by certiorari into the Court of King's Bench, but shall be deemed to be final to all intents and purposes whatsoever.

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* Conviction not liable to be quashed for want of form, or to be removed. N. B. An act was passed in the 10th of George the 3d chap. 30th, to rectify a mistake in the recital of the above act of the 6th Geo. 3d. and enacting, that the said act shall, notwithstanding such mistake in the recital of it, be taken, deemed, and adjudged to be valid and confirmed.

things relating thereto, shall extend, and be deemed, taken, and construed to extend, and shall be applied and put in execution, in relation to all his Majesty's forests and chases within this realm ; and to all and every person and persons who shall without legal right or authority, by night or day cut down, destroy, take, carry, or convey away, any hollies, thorns, or quicksets, growing or being upon any of his Majesty's said forests or chases, or within the woods, or wood grounds of any of his Majesty's subjects ; or who shall have in his, her, or their custody or possession, any such hollies, thorns, or quicksets, and shall not give a satisfactory account how he, she, or they came by the same, and shall be thereof convicted before one or more of his Majesty's justices of the peace, in the manner directed by the said act ; and such justice or justices is, or are hereby authorized to administer oaths, and proceed in the like manner for the conviction and punishment of every offender in the premises, as fully and effectually to all intents and purposes as if the several provisions in the said act had been herein particularly repeated and applied to the offences herein before specified.

That the conviction and convictions of all and every offender and offenders against this act, shall be certified by the justice or justices before whom made to the next general quarter sessions, to be filed amongst the records of the said sessions ; and that such conviction shall be fairly written on parchment or paper, in the following form of words (as the case shall happen), or in any other form of words to the like effect, viz.

To wit. { " Be it remembered, that on the day of in the year
" A. B. was, upon the complaint of C. D. convicted
" before of the justices of the peace for in pursuance of an
" act passed in the ninth year of the reign of his Majesty King George the
" Third, for (as the case shall be)
" Given under hand and seal the day and year above written."

Which said conviction shall be good and effectual in law to all intents and purposes, and shall not be quashed, set aside, or judged void or insufficient for want of any form or words whatsoever, nor liable to be removed by certiorari into the Court of King's Bench, but shall be deemed and taken to be final to all intents and purposes whatsoever.

Recites the act of the 6th of Geo. 3. chap. 48. and enacts, That the trees called poplar, alder, larch, maple, and hornbeam, shall also be deemed and taken to be timber trees, immediately after the first day of May, one thousand

seven hundred and seventy-three ; and all and every person or persons who shall after that period wilfully cut or break down, bark, burn, pluck up, lop, top, crop, or otherwise deface, damage, spoil, or destroy, or carry away, any poplar, alder, larch, maple, and hornbeam, or any part thereof, or the lops or tops thereof, without the consent of the owner or owners thereof first had and obtained, or of some person intrusted with the care of such tree or trees, such person or persons shall, if found guilty of any offence or offences, be convicted in like manner, as persons are directed so to be for offences of the like kind, concerning trees deemed timber trees, in the above in part recited act ; and upon such conviction or convictions, shall be liable to all and every the penalties, forfeitures, and punishments therein inflicted for any such like offence or offences ; and all and every justice and justices of the peace is and are hereby authorized, on complaint made to him or them of any offence or offences, to administer oaths, and to proceed in like manner to conviction and punishment of every offender against this act, as fully and effectually as if the said trees hereby declared, deemed, and taken to be timber trees, had been expressly so deemed and declared to be in the said act passed in the sixth year of his present Majesty's reign ; and such conviction and convictions shall be certified by the justice or justices before whom the same shall be made to the next quarter sessions of the peace to be holden for the county wherein such offence or offences were committed, in the form of words, or to that effect, directed by the said recited act ; and all and every the forfeitures for offences against this act shall be paid and applied in the manner forfeitures are directed to be paid in the said recited act.

larch, maple, hornbeam, deemed timber trees. Pen. destroying these trees as for other trees.

Upon the preceding state of the laws now in being for punishment of offences committed in the destruction of woods, it may be sufficient to remark, that from having a number of subsisting laws for the punishment of similar offences, enacting different modes of prosecution and penalties on conviction, confusion arises in the proceedings to convict offenders, by questions under which act the offenders shall be, or are proceeded against, and oftentimes the offenders escape, or oftener from the lenity of the magistrate the offender is proceeded against under the act inflicting the least punishment or penalty, notwithstanding the offence is atrocious, and the injury great within the provisions of the severer law ; it seems therefore worthy of consideration, whether it may not be proper to submit to the legislature a revision of these

last stated laws ; and whether it may not be wise to reduce them all in one well digested act of parliament.

The next and only remaining part of the second head proposed to be stated, is what statutes have passed relative to the inclosing of waste lands for the purpose of planting.

These laws are in a narrow compass, and appear to be as follows :

It shall be lawful for his Majesty, and all other owners of wastes, woods, and pastures in England, wherein any person or bodies politic have right of common of pasture, with the assent of the major part in number and value of the owners and occupiers of tenements to which the said right of common of pasture belongs, and for the major part in number and value of the owners and occupiers of such tenements, with the assent of the owners of the said wastes, &c. and for and other persons or bodies politic, with the assent and grant of the owners of such wastes, &c. and the major part in number and value of the owners and occupiers of such tenements, to inclose for the growth of timber or underwood, any part of such wastes, woods, and pastures, for such time, and upon such conditions, as shall be agreed.

In case any recompence be agreed to be given for such inclosure, to the owners and occupiers of tenements, to which the right of common belongs, such recompence shall be made either by a grant of a share of the profit of the timber or underwood growing on the ground so inclosed, or by a grant of other lands or hereditaments, or by some annuity or rent-charge issuing out of the ground so inclosed, or other lands, or shall be paid in money, to be placed out at interest on public security, or laid out in the purchase of lands or hereditaments, or of some annuity or rent-charge issuing out of lands ; and the produce of such lands, or such rent-charge, or the interest of such money until the same be laid out in such purchase, shall be paid to the overseers of the poor of the parish or township, and shall be by them applied towards the relief of the poor where such wastes, &c. lie, and accounted for as the rates for the relief of the poor. See Par. 64. And in case the owners of any such wastes, &c. and the major part in number and value of the owners and occupiers of the tenements to which such right of common belongs, jointly agree to assign their respective right in the said wastes, &c. for the purpose of making such inclosures, to any other person or body politic, and the owners of such wastes, &c. have not an estate in fee-simple therein, or be disabled or restrained from alienating the same, the recompence to be paid

to any such owners, shall be either by a grant of a share of the profit of the timber or underwood growing on the ground so inclosed, or by a grant of other lands or hereditaments, or of a rent-charge issuing out of the ground so inclosed, or other lands ; such equivalent to be held by the owners of such wastes, &c. and such as be intitled to the same in reversion, remainder, or succession, in like manner as the estate in such wastes, &c. is limited. And in case the inhabitants of any parish or township be willing to acquire such right of inclosure, for the employment of the poor, and any recompence be agreed to be given for the same, it shall be lawful for the overseers of the poor of such parish (by the direction of the major part of the inhabitants assembled at a vestry or public meeting, public notice being first given in the church on three Sundays before such vestry be held) to pay or purchase such recompence out of any monies arising from the rates for the relief of the poor ; and out of such monies to pay such charges as be necessary for inclosing and preserving such grounds ; and such overseers shall apply the profit of the timber or underwood growing thereon towards the relief of the poor ; and shall account for the same as for the rates for the relief of the poor.

Every agreement for any such inclosure shall be in writing, and signed by the parties, and shall be registered and inrolled by the clerk of the peace for the county or division where such wastes, &c. or the greater part of them lie, within three months after the execution of such agreement,

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It shall be lawful for all persons or bodies politic, who think themselves aggrieved by such agreement, or for any person in their behalf, within six months after such agreement is registered and inrolled, to make complaint by appeal to the justices of the peace at any quarter sessions for the same county or division, who are to determine such appeal, and whose determination therein shall be final ; and if no such appeal be made, the agreement so registered and inrolled shall be for ever binding to all persons.

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It shall be lawful for all bodies politic, whether aggregate or sole, and all feoffees in trust, executors, administrators, guardians, committees, or other trustees, for and on behalf of any infants, femmes covert, lunatics, idiots, or other persons, and the husbands of femmes covert, seised or interested in any such waste, &c. or any right of common in such wastes, &c. to agree to any such inclosure, and all such agreements so made shall be valid.

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If any person, after the time limited for bringing such appeal against any such agreement, by day or by night unlawfully cut, take, destroy, break,

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throw down, bark, pluck up, burn, deface, spoil, or carry away any trees growing within any such inclosure, without the consent of the owners, such owners shall have such remedy and satisfaction from the inhabitants of the parishes or places adjoining to such inclosures, and recover such damages, and in the same manner as is directed for dikes and hedges overthrown by the 13th Edw. 1st. chap. 46th. Approvement 2d.—unless the offender be convicted of such offence within six months after the commission thereof.

It shall be lawful for any two justices of the peace of the county or place wherein any such offence is committed, or for the justices of the peace for such county or place in sessions, upon complaint, to cause every such offender to be apprehended, and to hear and determine the same trespass, and to inflict the like penalty on every offender by them convicted as is directed by 6th Geo. 1st. chap. 16th.

1. If any person unlawfully cut, take, destroy, break, throw down, bark, pluck up, burn, deface, spoil, or carry away any tree growing in any waste, wood, or pasture, in which any person or body politic hath right of common, every such offender shall be in like manner convicted of such offence, and incur the like penalty.

It shall be lawful for any person or body politic to take remedy for the before mentioned damages, either against the parish or place where any of the said offences be committed, according to 1st Geo. 1st. chap. 48th, or 6th Geo. 1st. chap. 16th, or on the hundred wherein any of the said offences be committed, as to such person or body politic seems most meet, according to 9th Geo. 1st. chap. 22d. sect. 7th. felony.

2. If any action be brought for any thing done by virtue of this act, the defendant may plead the general issue ; and if the plaintiff discontinue, &c. the defendant shall recover treble costs.

Every recompence to be made by virtue of 29th Geo. 2d. chap. 36th. shall be made to the persons interested in the right of common, in proportion to their respective interests ; and not to be paid to the overseers of the poor, as is directed by the said act.

1. And whereas doubts may arise whether tenants for life, or for terms of years determinable upon one or more lives, be owners within the meaning of this act, and that of 29 Geo. 2. chap. 36. be it enacted, that the powers given to such owners by this act, and the said act may be executed by such tenants for life, or years during their respective interests.

Nothing done by such tenants for life, or terms of years, by virtue of this act, or by 29 Geo. 2. chap. 36. shall have effect or continuance after the determination of the estate of such tenants for life or terms of years. See forests.*

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Recites the acts of 29 and 31 of Geo. 2. for inclosing commons, for the purpose of planting and preserving trees and underwood, and for more effectually preventing the destruction of trees; and enacts, that every agreement made in pursuance of the said acts, for inclosing woods, wastes, or pastures, already taken in and inclosed, shall be of the same force and validity, and all the said inclosures shall stand and be confirmed and established in the same manner, as if such agreement had been registered and inrolled by the proper clerk of the peace, pursuant to the said act, provided such agreement hath been before the passing of this act, or shall be on or before the 25th day of December, 1770, registered and inrolled by the clerk of the peace for the county, &c. where such wastes, woods, or pastures, or the greatest part of them lie.

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It shall and may be lawful for all persons, or bodies politic or corporate, who think themselves injured or aggrieved by any such agreement not yet registered and inrolled, and where the lands inclosed in pursuance thereof have not already been planted with trees as aforesaid, to make complaint thereof by appeal to the justices at any quarter sessions for the said county &c. within six months after such agreement shall be registered and inrolled in manner as aforesaid; which said justices are hereby authorized and required to hear and determine such appeal, and whose determination therein shall be final.

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Where any such inclosure, before the passing of this act, hath been made by the owner or owners of wastes, woods or pastures, by and with the assent of the major part in number and value of the *owners of tenements*, to which a right of common therein did then belong, or by any other person or persons, bodies politic or corporate, by and with the assent of the *owner or owners of such wastes*, woods and pastures, and the major part in number and value of the *owners* of such tenements, such inclosures shall be deemed and adjudged to be as legally made, and are hereby established and confirmed, in like

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Where any owner of wastes, woods, or pastures, not having an estate in fee-simple therein, hath, before the passing this act, agreed to the making such inclosures of any part of his wastes, woods, or pastures, for the purposes aforesaid, and the recompence to be paid to such owner is by grant of some annuity, but the same is not in the deed of agreement made a charge upon, or expressed to be issuing out of the said ground or soil so inclosed, or any other lands, tenements, or hereditaments, as by the said act is required; such annuity so granted shall be deemed and taken to be a rent charge, issuing out of the said ground or soil so inclosed; and the said agreement shall be as good, effectual, and binding, to all intents and purposes, as if the same had been so expressly mentioned and granted in and by the said deed.

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An Act for the better Cultivation, Improvement, and Regulation of the Common Arable Fields, Wastes, and Commons of Pasture, in this Kingdom.

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Whereas there are in several parishes and places in this kingdom, *several wastes and commons*, and several open and common fields, which, by reason of the different interests, the several land owners and occupiers, or persons having right of common, have in such *wastes, commons*, and fields, cannot be improved, cultivated, or enjoyed, to such great advantage for the owners and occupiers thereof, and persons having right of common, as they might be, and are capable of, if an improved course of husbandry was to be pursued respecting such open and common fields, in each parish respectively, and *such wastes, or commons of pasture*, were to be properly drained, or otherwise amended: it is enacted, that in every parish or place in this kingdom, where there are open or common field lands, all the tillage or arable lands lying in the said open or common fields, shall be ordered, fenced, cultivated, and improved, in such manner by the respective occupiers thereof, and shall be kept, ordered, and continued in such course of husbandry, and be cultivated under such rules, regulations, and restrictions as *three-fourths in number and value* of the occupiers of such open or common field lands in each parish or place, cultivating and taking the crops of the same, and having the consent

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of the owners in manner herein after mentioned, and likewise the consent of the rector, impropiator or tithe owner, or the lessee, or either of them respectively, first had in writing, shall, at a meeting (in pursuance of notice for that purpose in writing under the hands of *one-third of such occupiers*, to be affixed on one of the principal doors of the parish church, chapel, or place where meetings have been usually held for such parish or place respectively, twenty-one days at least before such meeting, specifying the time and place of such meeting), by writing under their hands, constitute, direct, and appoint, and which notice any such occupiers are hereby authorized and empowered to give.

Provided always, that the rules so agreed upon shall not be in force or binding upon any of the parties thereto, for any longer term than six years, or two rounds, according to the ancient and established course of each parish or place respectively. Rules longer than six

That at every such meeting to be had as aforesaid, it shall and may be lawful to and for the *major part in number and value* of the occupiers (then present) of such open or common field lands in each parish respectively, to elect one or more proper person or persons as field master or field reeve, to superintend the ordering, &c. such open and common fields, and to see that the same are kept and continued in such course of husbandry, as shall be directed at such meeting, in manner aforesaid; and that such field master, so to be elected as aforesaid, shall continue in the said office until the twenty-first day of May then next following, or within three days after, and no longer, unless he or they shall be thereto re-elected, in manner hereinafter directed. See Field to be a

That all costs, charges, and expences, necessary for the carrying on any such plan of ordering as shall be agreed upon, and which shall at any meeting to be held, after six days notice having been given in manner herein before directed be agreed upon by the *major part in number and value* of the occupiers aforesaid, then present, be deemed common expences, and for the general benefit of the said occupiers, shall be borne, paid, and defrayed, proportionally by all the occupiers of such open and common field lands, according to the value of the lands and grounds each person or persons shall have in such open and common field lands, and for the raising the same, one or more assessment or assessments upon all and every the occupiers of common field lands in each parish respectively shall be made, levied and collected by such person and persons, and allowed in such manner as such majority of the See Expen be defi

occupiers of such open and common field lands, at such meeting to be had as aforesaid shall direct in that behalf ; and the money thereby raised shall be employed and accounted for according to the orders of such majority of the occupiers of such common field lands, for and towards the better cultivation of the said common field lands, from time to time, as need shall require ; and the said assessments shall, by virtue of a warrant under the hand and seal of one justice of peace of the county wherein such common field lands shall lie, be levied by distress and sale of the goods and chattels of every person so assessed and not paying the same within ten days after demand, rendering the overplus of the value of the goods so distrained (if any) to the owner or owners of such goods and chattels, after deducting the costs and charges of taking and making such distress and sale.

Sect. 4.
Occupiers of com-
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That it shall and may be lawful to and for the occupiers of open and common field lands, in any parish or place where any rules, orders, or regulations shall have been agreed upon for the ordering or improving of such lands, in pursuance of this act, and they are hereby required to meet and assemble at some convenient place, yearly, and every year, on the twenty-first day of May, or within three days after, in pursuance of six days notice to be given of the time and place of such meeting by one-third of the occupiers, in manner aforesaid, then and there to elect and choose one or more proper person or persons to be field masters, or field reeves, for the year ensuing ; and that such person or persons who shall, by the major part of the occupiers of the said lands present at such meeting, be chosen field masters, or field reeves, to superintend the ordering and improving of the said common field lands, and to see that the same are cultivated according to the rules agreed upon at the general meeting for that purpose, and shall continue in the said office for one whole year, unless he shall die, or be removed by virtue of the power and authority hereinafter given in that behalf.

Sect. 5.
Field reeves to
be elected in
the presence of
those who
are, or refuse
to be.

That if any field master or field reeve, so to be chosen in pursuance of this act, shall, within the year in which he shall be so chosen, refuse or neglect to attend the said business, or shall die, or remove to an inconvenient distance, or become bankrupt, or have execution against his body or goods, or by sickness or otherwise be rendered incapable of executing his said office, that then and in either of the said cases, it shall and may be lawful to and for the occupiers of the said lands (after six days notice for that purpose to be given in manner aforesaid), to elect in manner aforesaid, one other fit and proper

person to be field master, or field reeve, for the remainder of that year, in the place and stead of the former field master, or field reeve, falling under either of the descriptions aforesaid.

That it shall and may be lawful to and for *three-fourths in number and value* of the occupiers of open and common field lands, present at any meeting to be held in pursuance of fourteen days notice at least previous to the usual time of opening such common field lands, to be given for that purpose in manner aforesaid, to postpone the opening of such common field lands, for such reasonable time as at such meeting shall be thought necessary by such majority as aforesaid, and to settle and determine how long such common fields shall continue open, and to limit and settle the number of cattle each occupier in such parish or place shall respectively turn on such common fields, in due proportion to the stint or established usage in such parish.

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That nothing in this act contained shall be construed to extend to exclude any cottager or other person or persons whomsoever having right of common, and having no land in any of the said common fields, from having and enjoying his or their right of common, in as full and ample manner as he could and might have enjoyed the same before the passing of this act, unless such cottager, or other person, shall at any meeting to be held by the occupiers of such common field lands, in manner aforesaid, consent or agree in writing to a composition for such right, by an annual payment, or other annual advantage or compensation, or to a limitation thereof; in which case such consent and agreement shall be binding and conclusive upon every such person so agreeing, his heirs, and assigns, tenants and occupiers, until such time as the rules, orders, and regulations, for the ordering, fencing, cultivating, and improving of the said common field lands, existing at the time of giving such consent shall expire.

Sect
Cottager
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That if the occupiers of the said common field lands shall, at times when the said fields have been usually enjoyed in common consent, and agree not to depasture the same in common, and shall allot and set apart what shall be deemed by a majority of such cottagers, who shall not have agreed to compound for or limit their right of common, as aforesaid, a sufficient and equivalent common for such cottagers, and other persons, as aforesaid, to be enjoyed exclusively by them, that then and in such case such cottagers and other persons shall not enjoy their right of common over such parts of the said

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common field lands as are not used in common by the occupiers thereof, but only over such part thereof as shall for such time be allotted them for that purpose, and set apart as aforesaid; any law, usage, or statute, to the contrary notwithstanding.

act. 9.
of right to
be possessed of
the sheep
&c.

That nothing herein contained shall exclude any person or persons seised or possessed of a separate sheep walk, or pasture of cattle, in or over all or any of the common field lands in any parish or place, or in any or over any part thereof, from using, exercising, and enjoying such right, in as full and ample manner, to all intents and purposes, as he might or could have enjoyed the same before the passing this act, unless such person or persons, having such right as aforesaid, shall consent or agree in writing, at any meeting of occupiers to be held as aforesaid, to a composition for the same, or a limitation thereof; in which case every such consent and agreement shall be binding and conclusive upon every person so agreeing, and upon every other person coming to the possession of such sheep walk or pasture for cattle, by descent or otherwise, until such time as the regulations for the cultivation of the said common field lands, existing at the time of entering into such agreement, shall expire.

act. 10.
slades, &c.
consent of the
of manors,
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ed.

That it shall and may be lawful to and for any person whomsoever, having land in any open or common fields adjoining to any balks, slades, or meers, being waste, with the consent of the lord or lords, lady or ladies, of the respective manors wherein such balks, &c. do lie, and likewise of the person or persons who may have a separate sheep walk in the said fields, and with the consent of *three fourths in number and value* of the occupiers of such common field lands, to be signified at any meeting to be held in the manner aforesaid, to plough up any of the said balks, and convert the same into tillage, under the regulations to be settled as aforesaid.

act. 11.
&c. used as
not to be
ed.

That no balk, &c. that has heretofore been used as a public road, or as a private road, by any person or persons, to or from his or their own house or lands, be so ploughed up.

act. 12.
persons to be
ed by per-
forming a li-
o plough
&c.

That all and every person who shall have license, in manner aforesaid, to plough up and convert into tillage, any balk, shall, before he or they begin to plough up the same, lay down in an husbandlike manner, under the direction of the field master, or field reeve for the time being, in a more convenient part of the said field, as much of his or their own land, as shall be equal in value to the land he or they shall so have license to plough as aforesaid; and

that such land so laid down shall be common land, and so continue until the regulations then existing for cultivating such common field lands shall expire.

That the person ploughing any such balk, shall, by proper bound stones, sufficiently mark and distinguish the several lands ploughed, and the several lands lay down in lieu thereof, so that the property thereof, and each person's right therein may be clearly known and ascertained. See
Boundaries
ascertain
person's
may be

That it shall and may be lawful to and for the lord or lady of any manor,* with the consent of *three-fourths of the persons having right of common* upon the *wastes and commons* within his or her manor, at a meeting to be held, after fourteen days notice, such notice to be given in manner herein before directed by the lord or lady of the manor, or their agent respectively, any time to demise for any term not exceeding four years,† any part of such wastes and commons, not exceeding a twelfth part thereof, for the best and most improved yearly rent that can by public auction be got for the same; and that the clear net rents‡ reserved to the lord or lady, his, her, or their heirs, executors, administrators, or assigns, by any lease to be granted as aforesaid, shall be by him or her, and the major part of his or her tenants, applied in the draining, fencing, or otherwise improving of the residue of such wastes and commons.

That in every manor where there are stinted commons, in lieu of demising part thereof, one or more assessments upon the lord or lady of such manor, and the persons being owners or occupiers of such commons, or their agents, shall or may, at their option, be made, levied, and collected, by such person, and allowed in such manner as the lord or lady of such manor, and the major part in *number and value* of the owners or occupiers of such commons, present at a meeting to be held within the said manor, in pursuance of fourteen days notice, to be given by the lord or lady, or his or her agent, in manner aforesaid, of the time and place of meeting for that purpose, shall direct and appoint in that behalf; and the money thereby raised shall be employed and See
Assessments
levied in
proving
where the
stinted or

* Section 14. Lords of manors, &c. with consent of three-fourths of persons having right of common, may lease a twelfth part of wastes.

Wastes and commons.—*Three-fourths of the persons* having right of common upon wastes and commons. From this the *great difficulty* always arises in every regulation and improvement to be brought about of wastes and commons. And it seems right to enact, that three-fourths in value should always govern, if the legislature anxiously wish for great improvements to be made.

† The term of four years is inadequate, and too short.

‡ And the net rents to be applied for improving the residue of such wastes.

accounted for according to the orders and directions of the said lord or lady, and such majority of the owners or occupiers as aforesaid, in the improvement of such commons, from time to time, as need shall require ; and the said assessments shall, by virtue of a warrant under the hand and seal of one justice of the peace, be levied by distress and sale of the goods and chattels of every person so assessed, and not paying the same within ten days after being demanded, rendering the overplus of the value of the goods so distrained (if any) to the owner and owners thereof, the necessary charges of making such distress and sale being first deducted.

ct. 16.
commons
opened at a
time, as
&c. at a
g shall

That it shall and may be lawful for the *major part in number and value of the owners* and occupiers of such common pastures, present at a meeting to be held after six days notice, at least, given in manner hereinbefore directed, with the consent of the lord or lady of the manor, or his or her agent, to postpone the opening of stinted common pastures, for a time not exceeding twenty-one days.

ct. 17.
herds of
commoners, with
t of the lord
manor, &c.
direct the
g and shut-
common
es, &c.

That it shall and may be lawful to and for two-thirds in number and value of such commoners, at a meeting to be holden after fourteen days notice given in manner hereinbefore directed, with the consent of the lord or lady of the manor in which such commons are situated, his or her agent, to direct, order, and fix the time when such common pastures shall be broke or depastured, and when the same shall be shut up and unstocked ; such orders to continue in force for one whole year, and no longer.

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regulations.

Provided nevertheless, that a portion of such common pastures shall be separate and set apart for the use of such commoners exclusively, as shall not consent to such regulation, and the portion so set apart shall be adjudged by a *majority of such commoners*, not consenting as aforesaid, an equivalent for their rights of common.

ct. 18.
s having
f common
pasture
instead of
attle.

That it shall and may be lawful to and for the *major part in number and value of the persons* having right of common in such common pastures, at any meeting to be held in pursuance of notice, in writing under the hands of a major part of such owners and occupiers of such common pastures, or persons having right of common therein, to be affixed on the principal door of the parish church of the parish where such common pastures shall lie, or of the nearest parish church where such lands shall lie, in an extraparochial place, ten days at least previous to such meeting, specifying the time and place, and intent of such meeting, by writing under their hands, to alter and change

the manner and custom of feeding and depasturing such common pastures, so far as instead of horses, cows, and other cattle, to allow the same to be fed and depastured with sheep, at the option of each person respectively having right of common; and to limit and stint the number of sheep each person having right of common in such common pastures, shall respectively feed and depasture thereon, in due proportion to their respective stints or rights.

That no ram shall be turned upon, or be suffered to remain upon any wastes or common fields between the twenty-fifth day of August, and the twenty-fifth day of November, in every year.

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That it shall and may be lawful to and for the husbands, guardians, trustees, committees, or known agent or receiver of any owner and proprietor of wastes, commons, and common fields, and of any person having right or interest therein, being under coverture, minors, lunatics, or beyond the seas, and for every or any of them for the time being, and also to and for all and every or any of the said owners and occupiers, being tenants in tail, tenants by the courtesy of England, or tenants for life only, and to and for every or any of them respectively for the time being, to enter into and sign any agreement to be made in pursuance of this act.

That no rector or tithe owner, in right of his rectory, vicarage, or curacy, or the lessee of either of them respectively, who shall agree for or let his tithes of the said common field lands during the said term of six years, or any part thereof, shall receive any fine, foregift, gratuity, or compensation whatever, other than by equal half yearly or yearly payments.

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That every agreement so entered into in pursuance of this act shall be good, valid, and effectual in the law, for the purposes thereby intended, notwithstanding the want of legal title in the said owner or owners, or in the said husbands, guardians, trustees, committees, agents, or receivers, or in the persons acting as such, or in the said tenants in tail, tenants by the courtesy of England, or tenants for life only, any settlement or settlements, will or wills, to the contrary in anywise notwithstanding.

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in law

That no consent of any occupier of lands in such common arable fields, or of a separate sheep walk therein, to any such first agreement for the ordering, fencing, cultivating, and improving of such common fields, to be made by the authority of, or in pursuance of this act, shall be good and valid, unless such occupier shall, at the time of entering into such agreement, produce a written authority for that purpose, under the hand of the owner or proprietor, guar-

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dian or trustee, or in case of such owner not being a minor, and being in parts beyond the seas, of the known agent of such owner.

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That if any owner or occupier of any common field lands, or of any part thereof, for the better cultivation whereof any rules and regulations shall have been agreed upon, in pursuance of the powers and authorities given by this act, shall not conform to such rules and regulations, or shall wilfully deviate therefrom in any respect whatsoever, that then and in such case, it shall and may be lawful to and for any owner or owners, or occupier or occupiers, of any part of such common field lands, who may have been damnified by a breach of the regulations aforesaid, to bring one or more action or actions of trespass, or upon the case, in any of his Majesty's courts of record at Westminster against the person so offending; and if in any such action, so to be brought as aforesaid, a verdict shall be given for the plaintiff, or he shall recover judgment by default, that then and in such case, the party or parties so offending shall answer to the party grieved all such damages as shall be recovered in such action, together with double costs of suit.

tion 25.
son is hereby
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own use.

That nothing in this act contained shall prevent, or extend to prevent any person or persons from inclosing all or any part or parts of his, her, or their land, to and for his, her, or their own use or benefit, *such person or persons having full power or right so to do.*

tion 26.
all rights
Majesty,
of manors,

Saving always to the King's most excellent Majesty, his heirs and successors, and to all and every lord and lady of any manor or manors, and to all and every other person, bodies politic or corporate, his, her, and their heirs, successors, executors, and administrators, (other than and except the respective persons, their heirs, successors, executors, and administrators, who may, in consequence of this act being duly carried into execution, become subject to the provisions and regulations thereby authorized to be made), all such estate, interest, and rights, as they, every, or any of them, had or enjoyed in and over the said common arable fields, wastes, and commons of pasture, before the passing of this act, or could or might have had and enjoyed in case the same had not been made.

*Observations on the Statutes passed for Inclosures for Planting;
and Conclusion.*

As far as these statutes go, they are useful ; and I have in practice seen some inclosures made under them : but then they have been only small tracts, and not of any great extent, for the desirable purpose of growing wood and timber. The act last stated goes much the furthest to promote the useful plan of improvements in the cases it comprehends ; and therefore I have stated it more at large than the other acts. By some few amendments it perhaps might be made useful in the cases to which it extends, until further arrangements can be made comprehending the general plan ; since amending such law in being may be done with less obstruction perhaps than forming a general law at first, to comprehend inclosures of all wastes : but then all these acts use the words, “ The major part in number and value of the owners and “ occupiers of such tenements, with the assent of the owners of the said “ wastes,” or in the last, for leasing wastes, *three-fourths* of the persons having right of common. What that *major part* shall be in number and value of the owners, in like manner as in the rule followed on passing acts of parliament for inclosures, creates the difficulty, and overthrows the good effects of these acts, which otherwise must be highly beneficial ; for although the acts for inclosing commons for planting have been many years in force, they have been but of trifling use ; more indeed for pleasure and convenience than for real essential advantage in planting ; the difficulties to obtain consents from the major part in number and value of persons interested, being almost insuperable ; every small cottager counting equal with persons of large estates. In order to promote the great and useful purpose of general improvement, and of growing timber upon the large and extensive wastes of this kingdom, which may be more particularly adapted to the growth of wood and timber, it is therefore submitted, that it may be proper to propose to the legislature a revisal of these acts ; and to pass an act to explain and define, what the *major part in number or value of the owners and occupiers of tenements shall be, to govern the inclosure of waste lands*, as well for general improvement, and for the purpose of planting for the growth of wood and timber, with the consent of the lord of the soil ; and it is submitted, that it

would be equitable that this majority should be fixed at *three-fourths in value* of the persons interested, to govern in all cases; which would remove the impediments now so great, by taking into the number the small cottagers, who always oppose such improvements in an equal line with persons of large property, and who, from their large property, are consequently entitled to a greater admeasurement of common. Should the legislature attend to such proposition, the happiest effects to the public may be expected to result from the measure, by forwarding general improvements and inclosures of waste lands for these purposes. Encouragements for the growth of wood, and particularly of naval timber, is become highly necessary to this kingdom, and essential to its welfare and continuance as a naval power; as appears from the 11th Report of the commissioners of the land revenue. The legislature therefore perhaps, on due deliberation of this question, in their wisdom may think it right to go even somewhat further with regulations for encouraging the growth of wood and timber.

In all inclosures of wastes and commons, the lord of the soil is deemed to be entitled unto, and almost always has set out and assigned to him a certain proportion of the waste, quoad lord: would it be too much to submit to the legislature, that the lords of wastes, as lords of the soil, should, on requisition and application to the Lord Chancellor, have a certain limited proportion of the waste within their manors, assigned and set out to them by a short and summary process, to be inclosed by them, part for general improvement, and other part expressly and strictly limited for the purpose of planting; and to be enjoyed by such lords in severalty, in distinct parts for general improvement, and for the growth of wood and timber, as the respective wastes are best adapted to; and where there are very large wastes and commons sufficiently adequate to the lord's part, and to the rights of common thereon; after due admeasurement of common, might not provision be made to inclose a certain other proportion of such large wastes, at the expence of the parish, to be planted, enjoyed, and held in severalty for the benefit of the poor of the parish or place in which the inclosure is made. Or rather, as a better plan, and less subject to abuse and mismanagement; might not provision be made to enable a *majority in value of the parishioners interested*, with the consent of the lord of the soil, to sell a certain proportion of such large wastes, beyond the due common right, to be ascertained as aforesaid, in order to raise a sum of money, as a fund for the benefit and purposes of the poor of such

parish ; either by building poor-houses, or to create a fund to go in aid of the poor's rates, and the maintenance of the poor, as the parishioners, as above mentioned, shall adjudge and order ; but such portion of land so to be sold to be expressly limited to be always and continually held, preserved, and kept in planting, for the growth of wood and timber : or where there are very large and extensive wastes, much beyond what can be occupied by a due admeasurement of pasture, as there are it is believed in some parts, might not the legislature pursue the precedent set by the statute of 12th of Ann. statute 1. chap. 4. sect. 1. above stated, for inclosing wastes in the West Riding of Yorkshire for poor curacies ; and in that case direct the surplus, after admeasurement, or certain other proportions of wastes to be inclosed or to be sold for the benefit of the church, and in aid of poor curacies. The payments for tithes, in all such cases of inclosures, to be compensated by some general arrangement for tithes, or under each particular inclosure.

But in all and every such case, the lands and wastes so inclosed to be held in severalty solely and entirely, for general improvement, or as they may be best adapted, as planted ground for the growth of wood and timber.

The great benefits that will result to this kingdom, by establishing a system for the growth of wood and timber on our wastes, especially on those best and most adapted for this purpose, (and many of them are such as cannot be otherwise cultivated) are so self-evident, that I will not trouble you by particularly stating them ; only remark, that the decrease of timber in this country is felt ; that the failure of supply is to be dreaded, and would be fatal to us as a naval power ; and that every measure the legislature can take to encourage and promote the growth of wood and timber on the wastes of the kingdom, appears to be called for as highly wise and politic, more especially as the inclosed lands within the kingdom are thrown into, and are daily continuing to be thrown into agriculture, more than into wood.

The improvement and cultivation of Hounslow Heath seems already to have been partly proceeded in, as above stated ; and the further proceedings to be had hereon, if the measure is adjudged proper to be pursued, (except as to the point of tithes) seems to be a process that must be governed only by its peculiar case ; proceeding, as near as may be, agreeable to the general system of promoting inclosures and improvements.

Having now stated to you, for the consideration of yourself, and the Board of Agriculture, such matters as have occurred to me on the subject of inclo-

ing and improving waste lands and commons, and commonable lands, to which the attention of the Board has been so wisely turned ; I have only to ask your pardon for having intruded so much in submitting the ideas which have struck me ; and to assure you, that if any thing which I have above stated, shall be found useful, or be deemed worthy the attention of the Board of Agriculture, it will highly gratify me, in having been so fortunate as to aid a system of improvement that must be highly beneficial and advantageous to the community.

I have the honour to be, with great regard and truth,

SIR,

Your most faithful

and most obedient humble servant,

5th April, 1794.

JOHN ROBINSON.



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PLAN OF AN AGREEMENT
AMONG THE
POWERS IN EUROPE,
AND THE
UNITED STATES OF AMERICA,
FOR THE PURPOSE OF REWARDING
DISCOVERIES
OF GENERAL BENEFIT TO
SOCIETY.

BY
SIR JOHN SINCLAIR, BART.
PRESIDENT OF THE BOARD OF AGRICULTURE.

LONDON :

PRINTED BY W. BULMER AND CO.
M.DCC.XCV.

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PLAN OF AN AGREEMENT, &c.

THE plan of establishing a Board of Agriculture, for promoting the internal improvement of Great Britain, though long a favourite idea of the Person who brought forward that proposal, yet could never have been carried to its present state of perfection, had it not been for an extensive Tour which the Author made, through some of the most interesting parts of Europe. In the course of that Tour, he saw several valuable institutions for public purposes, from each of which, as well as from those at home, he took such hints as seemed to him likely to be of service, and formed on the whole the plan of an establishment, on a scale sufficiently extensive, to merit, in his opinion, the approbation of the British Parliament: They were prevailed upon to adopt it, not, however, without some opposition, and merely as an experiment. The result, he flatters himself, must be in the highest degree satisfactory to those who wished well to such an undertaking. The Board was constituted only on the 4th September, 1793, and already a greater mass of Agricultural and Statistical knowledge has been collected, in little more than a year and a half, than ever was accumulated before in so short a period.

The improvement of his native country, was not the sole object, which the Author, however anxious to promote it, had in view when he formed this establishment. He knew well that it would soon prove of general benefit to Society. The carrying on, therefore, a correspondence with foreign states, disposed to enter into such an intercourse, was a part of the original plan. A Secretary, acquainted with several of the most important lan-

guages in Europe, was attached to the Board, for the purpose of conducting that correspondence ; and though the war, so generally raging on the Continent, has given a different direction to the minds of men, and greatly impeded such an intercourse, yet much useful information has been received from, and communicated to, foreign countries, since the Board was established.

There are some points connected with the improvement of a country, which are only applicable to particular places ; an improvement, for instance, in the culture of the vine would be of no use to the northern parts of Europe ; nor would it be of any consequence in the southern, that the Scotch fir could be made doubly valuable, by using the branches of young fir, as an article of food for sheep or cattle, in the winter season, when it is so difficult to support them. There are many objects, however, of equal importance to all countries, and in the improvement of which, every nation is equally interested ; for example, any discoveries in consequence of which a greater quantity of animal or vegetable food can be produced for the use of man,—any improvement in medicine,—in the means of saving fuel,—in the construction of houses for the lower orders of the people, &c. and many other particulars of a similar nature.

Discoveries made in one country, gradually reach another : but the interval is often tedious, and the loss thereby sustained is great ; whereas if the progress could be more accelerated, the consequences might be in the highest degree beneficial, not only to the country that receives, but to the one that makes the discovery. For no individual, or even nation, can carry any art or new invention to its ultimate state of perfection. It must be improved upon for that purpose by the investigation and the

Deeply impressed with the justness and importance of these ideas, I take the liberty of submitting to the consideration of those intrusted with the government of this, and of other States, the propriety of a general Agreement among the Powers of Europe, and the United States of America, for the purpose of rewarding those who make any useful discovery, interesting to the Species at large, in Rural Economy, in Medicine, or in the Useful Arts, and that every means be taken to have the same rapidly extended, and brought to its ultimate state of perfection.

Such an agreement would be attended with but little expence to the different Powers who entered into it, whilst the credit, the satisfaction, and the benefit which each government would ultimately derive, from such an understanding would be of infinite value.

If each power should agree to pay a sum, call it from £50. to £500: or £1000. according to the amount of its revenue, and to the advantage it would be likely to obtain from any new invention of the nature above alluded to, it would be of little consequence to each, whilst the total would be of considerable value to the fortunate discoverer.

The attention of mankind being directed to such useful objects, it is impossible to say to what perfection the arts necessary for their comfort and sustenance might be carried.

The desire for fame and emolument, and the emulation of many nations, rivalling each other in such arts, would soon produce discoveries, the importance of which can hardly be estimated at present.

And such an understanding, though it would not probably put a stop to war, yet might have the effect of rendering wars less

I was led to bring forward such reflections, sooner than otherwise I had intended, in consequence of having lately succeeded in obtaining from Parliament, the grant of £1000, to Mr. Joseph Elkington, so celebrated for his skill in Draining, and knowledge of Springs.

The art which he has acquired in such perfection, would be as useful to other countries, as it is to Great Britain, and no reason can be assigned, why it should not be immediately extended all over Europe and America.

Here there can be no rivalry; for the Agricultural prosperity of one country can do no injury to another; and indeed it may be of considerable service, in times of scarcity for instance, from which the most fertile cannot always be exempted.

Let us suppose, therefore, that such Powers as chose to enter into the Agreement above suggested, in addition to the £1000. already voted by the British Parliament, were to begin the proposed agreement, by subscribing each a sum of money to Mr. Elkington, on his disclosing his discoveries in so clear a manner, that other nations might avail themselves of the same valuable art.

Can any discovery be of more general utility? In a moist country, it is well known, that nothing is so much to be wished for as to get rid of water. In a country that is dry and parched, what can be more desirable than to obtain the command of springs?—In both these respects, there is every reason to believe, that Mr. Elkington has reached a very high, and hitherto unequalled, pitch of excellence.

If examples of the benefit to be derived from such an agreement, in regard to other matters, independent of Agriculture, is wanting, it may be sufficient to remark, that an American physician is said to have found out a valuable remedy for the cancer, and

a German, a very effectual palliative, if not a cure, for the stone and gravel. As these are acknowledged to be perhaps the most dreadful disorders to which the human frame is subject, surely such discoveries are objects of general concern, and if brought to perfection, ought to be rewarded by every civilized Power in the Universe.

The only objection to such a measure, is, the risk of imposition on those Powers, who live remote from the place where such discoveries may be made. But surely those who trust their respective Ministers with the management of great political concerns, may safely confide to them the disposal of any sum that may be necessary for such a purpose. Besides, it would be desirable to have a Board of Agriculture and Internal Improvement established in every country, for the purpose of carrying on a correspondence and intercourse between the different States of Europe and America, on subjects of general moment, and to the examination of such a body, any discovery of a doubtful nature might be referred.

If the measures above hinted at were adopted, a new scene in politics might be the happy consequence, and the rulers of nations might in future boast,—not of their numerous fleets,—not of their gallant armies,—not of extended commerce,—of splendid or luxurious arts, or acquisitions by intrigue or conquest,—

BUT OF THIS,

That within their respective dominions, a greater number of human beings, enjoyed all the blessings of political society, in greater perfection, than ever they had been able to attain, in any former period of





OUTLINES
OF THE
FIFTEENTH CHAPTER
OF THE
PROPOSED GENERAL REPORT
FROM THE
BOARD OF AGRICULTURE.

ON THE SUBJECT OF
MANURES.



OUTLINES
OF THE
FIFTEENTH CHAPTER
OF THE
PROPOSED GENERAL REPORT
FROM THE
Gt. Brit. BOARD OF AGRICULTURE.

ON THE SUBJECT OF
MANURES.

DRAWN UP FOR THE CONSIDERATION OF THE BOARD OF AGRICULTURE AND
INTERNAL IMPROVEMENT.

BY ROBERT SOMERVILLE,
OF HADDINGTON.

LONDON :

PRINTED BY W. BULMER AND CO.

M.DCCC.XCV.

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ADVERTISEMENT.

THE following Sketch or Outline, will explain the nature of the General Report, which it is proposed shall be laid by the Board of Agriculture, before His Majesty, and both Houses of Parliament, for the purpose of pointing out, the present Agricultural State of the Country, and the Means of its Improvement. It is intended that the Report itself, shall be drawn up in a concise and plain manner, but at the same time with as much distinctness and perspicuity as possible, so as to be adapted to the capacity of every individual, who may wish to be made acquainted with the subject. The Appendix will contain those minuter facts and more detailed observations, which are necessary for the consideration of those, who make the cultivation of the soil, or the breeding of animals, a profession. The object of the whole is, to give such an abstract of agricultural knowledge, either accumulated by the Board since its establishment, or previously known, as will make Skill in Husbandry, easily attainable, and at little expence, by the poorest of our husbandmen, or by the meanest capacity.

It is hardly necessary to add, that the following is merely the sketch of the Chapter, which is printed at present, for the purpose of procuring such corrections and additional remarks. as

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may occur on the perusal. It is proposed to circulate this, and the other Chapters of the Report, as soon as they are respectively printed, among the Members of the Board, who will please to communicate it to such of their friends as are conversant in those subjects; and return it to the Board early in the course of the ensuing winter, with every suggestion that can tend to its improvement.

Whoever takes the trouble of perusing the following sketch, and considers for a moment the effect of having such a paper examined, corrected, and enlarged by the observations of at least one hundred intelligent persons, conversant in those subjects, must see that the knowledge of the use and application of Manures, is likely to be brought to a degree of perfection, which would not otherwise have been attainable.

CONTENTS.

	PAGE		PAGE
Advertisement	v	Mode of applying Manure	14
Preliminary Observations	7	1. Mixing with the Soil	ib.
List of Manures	10	2. Manuring in Drills	15
Of Composts	11	3. Top-Dressing	ib.
Of a Mixture of Soils	12	Conclusion	20

APPENDIX.

Introduction	23	24. Decayed vegetable Substances	52
1. Dung of Quadrupeds	ib.	25. Watering	ib.
Plan of a Dunghill	28	26. Putrid Water from the Steepings	
2. Dung of Birds	34	of Flax, Hemp, &c.	53
3. Night Soil, or privy Manure	ib.	27. Burnt Limestone	54
4. Urine	35	28. Unburnt Limestone	69
5. Bones	ib.	29. Chalk	ib.
6. Putrid Animal Substances	37	30. Limestone Gravel	70
7. Refuse of Shambles	ib.	31. Marls	71
8. Refuse of Manufactures	ib.	32. Sea-Shells	73
9. Rape Cake	38	33. Pot-Ash; or fixed vegetable Al-	
10. Oil	39	kali	74
11. Fish	40	34. Kelp	75
12. Sea Weed, or Ware	ib.	35. Bleachers' Ashes, or Refuse	76
13. River Weed	42	36. Soap-Ashes	77
14. Mud	43	37. Soap-Ley	ib.
15. Sweepings of Streets	ib.	38. Fern-Ashes	78
16. Sweepings of Roads	44	39. Peat-Ashes	79
17. Earths, and Earthen or Mud Walls	ib.	40. Wood-Ashes	81
18. Malt Dust, or Comb	45	41. Coal-Ashes	82
19. Tanners' Bark	ib.	42. Ashes from Paring and Burning	ib.
20. Soot	46	43. Of Sea-Salt as a Manure	ib.
21. Peat Moss	ib.	44. Gypsum	85
22. Sheep Folding	50	45. Burnt Clay	87
23. Ploughing in of Green Crops	51	Conclusion	88

CONTENTS.

ADDENDA.

	PAGE		PAGE
No. I. Communications from J. B. Scandella, M. D. -	1	specting Rape Dust as a Manure -	27
No. II. Communications from Mr. Farey -	14	No. VII. Flax Seed, Hemp Seed, as Manures -	29
No. III. The Method of Burning Clay	18	No. VIII. Refuse of Mustard Works as a Manure -	31
No. IV. Communications from Mr. Smithe -	20	No. IX. Fell-mongers' Poake as a Manure -	32
No. V. Of the Use of Lime as a Manure -	25	No. X. Refuse of Potteries as a Manure -	34
No. VI. Communications from Sir Thomas Gascoigne, re-		No. XI. On Salt as a Manure -	35

OUTLINES OF CHAPTER FIFTEENTH,

ON THE SUBJECT OF MANURES.

PRELIMINARY OBSERVATIONS.

FOR ADDITIONAL
AND OBSERVA'

THE term Manure, is applied indiscriminately to all substances, which are known from experience, either to enrich the different soils, or contribute by any other means to render them more favourable to vegetation.

Though little doubt can be entertained of the utility and necessity of such substances, yet the progress hitherto made, in ascertaining the mode in which they ought to be applied, the quantity that should be made use of, or the soils for which they are respectively best adapted, has not yet reached that perfection or certainty that could be wished for.

The most superficial observation will serve to convince every intelligent person, that in an Agricultural point of view, the subject of Manures is of the first magnitude. To correct what is hurtful to vegetation in the different soils, and to restore what is lost by exhausting crops, are operations in Agriculture, which may be compared to the curing of diseases in the animal body, or supplying the waste occasioned by labour, or the ordinary evacuations of nature.

The utility of Manuring has, however, been questioned in some instances, particularly by *Tull* and his disciples, who assert that *Tillage alone*, frequently and judiciously applied, will produce every effect that can be expected from that practice.

That Tillage is essential to the success of Agricultural operations, is a point in which all good husbandmen are agreed ; but that by Tillage alone, the earth should be made to produce a succession of valuable crops of grain or vegetables, is a doctrine, which, fortunately for the advancement of Agriculture, has met with very few converts. By such management, poor lands would never become productive, and the richest soils would soon be exhausted.

Another opinion has been held forth to the public, that when land has once been put into good heart, it may be preserved in a state of constant fertility, merely by a proper *rotation of crops*, without any foreign Manure.

In some particular spots, where the soil is uncommonly rich, and has been long undisturbed by the plough, and when great quantities of animal and vegetable matter have been accumulating for ages, this may, for a considerable space of time, be the case.

But if the advocates for such a system assert that *any land*, when once put into good order, will continue to pour forth an endless succession of valuable crops, by means of judicious rotations alone, without any Manure being made use of,* we pronounce the idea, with but very few exceptions, impossible.

Indeed it might as well be supposed, that any animal, after having made a full meal, would continue to live, and perform every kind of labour, without any farther supply of food. The contrary certainly is the case, both with regard to animals and vegetables ; for if the nourishment supplied is less than the waste, the animal will die, and the soil become barren.

But it is unnecessary to extend our observations upon this

* Mr. Kent, in his *Hints to Gentlemen of Landed Property* (page 71.) states it as his opinion, that any limited portion of land, tolerably good in its nature, will, if well cultivated and moderately stocked, produce vegetable and animal Manures sufficient to support it for ages, without any foreign aid. But Mr. Maxwell, in his *Agricultural Report of Huntingdonshire*, goes still farther, and seems to consider the use of dung, when once land is put into good order, as totally unnecessary, where a proper rotation is followed. Vide Maxwell's *Huntingdonshire*, p. 31.

subject farther, for a good farmer who wishes to avail himself of every advantage which experience points out, will, to a certain degree, adopt 1. *the Tillage recommended of Tull*, for the purpose of pulverizing the soil and extirpating the weeds with which it may be infested. 2. *A regular rotation of crops*, in order that the various sorts of earth, may, in their turn, according as they are calculated for different plants, become productive : and 3. *a sufficient quantity of Manure*, not only to prevent the soil from being exhausted, but if possible annually to make some addition to its former sources of fertility.

For the purpose of bringing a subject of such acknowledged importance as Agriculture, to a higher degree of perfection than it at present possesses, a thorough investigation of every branch of it is necessary. It is, however, to be regretted, that the foundation of the whole, namely, the principles upon which fertility and vegetation depend, are still but imperfectly understood. Even the little knowledge of these matters which we are at present in possession of, has hitherto been confined to the closets of the learned, and seldom been deemed a necessary part of education, for those, whose prospects and success in life, depend so materially upon a judicious and scientific system of husbandry.

In the article of Manures especially, this knowledge would be peculiarly useful ; for, by it the intelligent farmer would be enabled to examine and ascertain the distinguishing properties of the articles he makes use of ; to collect, prepare, and employ them to the greatest advantage ; and to accommodate them to the soil for which they are respectively the best adapted ; and thus by having it in his power to combine the cause and the effect, he would have the means of calculating, with much more certainty than it is possible for him otherwise to do, upon the success of all his operations.

Having premised these general observations, we shall now proceed to state the various sorts of Manures made use of in these kingdoms ; and after briefly considering the advantage of combining two or more of them together into one compost, shall then add some General Remarks upon the mode of applying them.

Authors have attempted to divide Manures into various classes, as into simple and compound, natural and artificial, nutritious and stimulating, or as they are derived from the animal, vegetable, or mineral kingdom; but unless philosophers were more agreed, with respect to the principles upon which they respectively act, every attempt at classification must be liable to considerable objections, and therefore cannot be attempted with advantage on the present occasion.

LIST OF MANURES.

- | | |
|---|--|
| 1. Dung of quadrupeds. | 24. Decayed vegetable substances. |
| 2. ——— of birds. | 25. Watering. |
| 3. Night soil, or privy manure | 26. Putrid water from the steepings of flax or hemp. |
| 4. Urine. | 27. Burnt limestone. |
| 5. Bones. | 28. Unburnt or pounded limestone. |
| 6. Putrid animal substances. | 29. Chalk. |
| 7. Refuse of shambles. | 30. Limestone gravel. |
| 8. Refuse of manufactures. | 31. Marle. |
| 9. Rape cakes. | 32. Sea shells and coral. |
| 10. Oil. | 33. Pot ash. |
| 11. Fish. | 34. Kelp. |
| 12. Sea weed. | 35. Bleachers' ashes. |
| 13. River weed. | 36. Soap ashes. |
| 14. Mud from ponds, rivers, or the sea. | 37. Soap ley. |
| 15. Sweepings of streets. | 38. Fern ashes. |
| 16. Sweepings of roads. | 39. Peat ashes. |
| 17. Earths, and earthen or mud walls. | 40. Wood ashes. |
| 18. Malt dust. | 41. Coal ashes. |
| 19. Tanners' bark. | 42. Ashes from paring and burning. |
| 20. Soot. | 43. Sea salt. |
| 21. Peat moss and peat dust. | 44. Gypsum, or Paris Plaster. |
| 22. Sheep folding. | 45. Burnt clay. |
| 23. Ploughing in of green crops. | |

An account of the nature, properties, and mode of applying each of these, will be found in the Appendix.

OF COMPOSTS.

Every farmer of experience knows that certain compounds, formed between the different kinds of Manures and soils, have a much greater effect in promoting vegetation, than any of these taken separately. But though this circumstance is familiar to most of them, they have hitherto made little progress in ascertaining the manner in which composts operate, or the principles upon which their operation depends.

In analyzing the different soils and manures, we learn, that some of them contain more animal or vegetable matter, than they do salts or earths; and *vice versa*. From this disproportion of principles, such soils and manures are less productive than they would otherwise be, if their useful qualities were more equally balanced. By compounding or mixing the two together, that end is attained.

Some farmers object to composts on account of the expence, and affirm that every addition of soil, or other substances, made to a dunghill serves only to increase its bulk, and the expence, without adding any thing to its real value; and that the dung itself is a much better manure, upon all soils, than it can possibly be made by any addition.

That the dung of animals is a most valuable article is beyond all doubt, but it certainly is not equally useful in all soils and situations. It is much better calculated for what are called active, than for inactive soils. On limestone, chalk, &c. &c. it meets with abundance of active materials, which compensate for the want of them in itself. But upon *clays, deep loams, &c. &c.* it operates best in conjunction with lime, or some other stimulating substance.*

* When dung is intended for a compost, no attempt should be made to add any large quantity of lime or earth, till it is properly fermented; as every

When earth is added to such a compost, care should be taken to regulate the quantity in such a manner, as to prevent it from pressing the dunghill too hard ; for, in every instance where this happens, the air will be excluded, so much as to prevent a second fermentation from coming on ; and the compost in that case will neither incorporate so well, nor be so valuable.

OF A MIXTURE OF SOILS.

Next to the application of the various sorts of Manures above-mentioned, the fertility of the earth depends upon the predominant qualities of the soil ; every different kind of which being made up of the same principles, but differently proportioned. In cases where there is a deficiency of any of these, the fault may be rectified by the application of another soil, containing the ingredients that are wanted. Thus, where clay predominates, the addition of sand, is often sufficient to insure fertility, and, where sand prevails, the addition of clay or chalk answers the same purpose. Gravelly soil enriches moss, and moss improves gravel. Indeed, until the soil acquire a due proportion of the various ingredients

addition of that kind will be found to check fermentation, and diminish the value of the compound. The lime and earth should be added, after the fermentation is finished, and the whole carefully mixed and laid up together. A few days after this is done, a second fermentation will come on, and, if the mixture has been properly turned over and thoroughly incorporated, in a month or six weeks afterwards it will be fit for use.

Considerable judgment and attention will, however, be requisite, with regard to the quantity of lime, and other active principles employed ; for if the quantity is small, their action upon the rich substances contained in the dung, will be partial and imperfect : and if too great, a considerable loss may be sustained by their over action. The proportion that will bring their active and passive qualities nearest to a balance, or, in plainer language, the quantity that will dissolve the enriching substances contained in the dung, will certainly be found the most useful.

that are necessary to insure fertility, the husbandman is particularly called upon to search every where, in the neighbourhood of his fields, for such substances as are likely to accomplish this desirable purpose.*

We wish this circumstance be particularly attended to, as there is abundant reason to believe, that every field has in its neighbourhood some substance, which if properly applied, would give it fresh powers of production. To discover this, not only the surface, but the different sub-soils should be carefully examined, and it is more than probable that some useful article will be found, which if mixed either with the dung of the farm, or applied by itself, will render the soil more fertile.

This mixture of soils answers many very important purposes in agriculture. Stiff soils, which water can hardly penetrate, are by a proper mixture of light earth, sand, or other incoherent substances, opened and subdivided, so as to admit freely a quantity of moisture and other nutritive matters, sufficient for the nourishment of plants.†

Light soils again, by being incorporated with clay, are thereby rendered more retentive of moisture: by this mixture also the roots of vegetables are at full liberty to spread themselves in all directions, not only in search of their natural food, but also to acquire an establishment in the soil, sufficient to support the trunk and branches of the plant. For it is found, that no vegetable can arrive at perfection, if the roots are prevented from spreading themselves out at pleasure, and, at the same time, taking a sufficient hold of the earth; neither of which can be the case in very stiff or very loose soils.

* The celebrated chemist, Kirwan, very justly remarks, that one of the great desiderata in husbandry, seems to be this, namely, to discover the composition of the different earths best suited to detain or exhale the due proportion of the average quantity of moisture that falls in each particular country. See *Irish Philosophical Transactions*, vol. v. p. 197.

† The following is a striking instance of the benefit resulting from a mixture of soils. Mr. Elkington had on his farm of Princethorpe, some fields of strong clay, which he could not plough in a wet season, nor could wheat be

MODE OF APPLYING MANURE.

Manure is usually applied in three different ways. The first and most common is that of ploughing it in and mixing it with the whole soil. The second is that of laying it carefully into drills, and sowing the crop upon it. And the third is that of spreading or scattering it upon young crops, and either harrowing it in or allowing it to remain upon the surface. There is a fourth mode, which has been recommended to the attention of the Board of Agriculture, namely, that of incrusting the seed sown with the calcined salt of vegetables and with oil. But it seems unnecessary to dwell upon that idea until its advantages are proved by experiment.

I. MIXING WITH THE SOIL.

As yet, this is by far the most general mode of application, and where Manure can be had in great quantities, it is naturally adopted, the other modes being infinitely more troublesome. It is also the best system where it is necessary to enrich a field for a succession of exhausting crops. But it is questionable whether

always sown in it at the proper time. He was sometimes obliged to employ 6 horses to plough it, and 7 men to level it, by cutting the heaps with 3-pronged forks, as spades could not be made use of on account of their sticking. But by carrying a great quantity of sandy soil, (120 loads per acre), and adding afterwards one coat of marl, the quality of the land became so changed, that 3 horses can plough it, that no men are necessary for levelling it, and that in the wettest season wheat can be sown. The expence of digging and carriage, may be calculated at 18s. per 50 load, which is equal to about 2l. per 120 load. Suppose that the marl cost 1l. per acre, the whole cannot be called a great expence, for so durable and permanent an improvement, which adds to the staple value of the soil, instead of being a more temporary advantage.

it is the best means to make the most of the Manure collected, as some of the most valuable parts of the Manure may be ploughed deeper than the roots of many vegetables go, and in some cases, may be entirely washed into the earth and lost.

II. MANURING IN DRILLS.

This mode is but partially used, and only for particular crops, as potatoes, turnips, and the like, when the advantages derived from the practice are so much extolled, though not decisively ascertained, that it is a matter of surprise that it has not been extended to other descriptions of drill crops. The plant sown upon the manure in this manner, has the chance of receiving the whole benefit of that manure in all the stages of its growth, and if the land is afterwards ploughed cross-ways, and well harrowed, what remains of its strength and substance is incorporated with the soil. The crops of turnips and potatoes produced by following this plan, on very indifferent soils, and with a small quantity of manure, it is asserted by the friends of this system will sometimes equal what a rich soil, with a great quantity of Manure will yield.

III. TOP-DRESSING.

Top-dressings are principally confined to particular substances, such as *soot*, *rape-cake*, *pigeons' dung*, *peat-ashes*, &c. the beneficial effects of which, when applied in this way, are well known, and having been found to answer so well, particularly with crops which tiller, as wheat and barley, it is a matter entitled to the most serious investigation, whether their success has not risen as much from the manner in which they are applied, as from their own essential qualities; and as this is a part of the subject which has hitherto been less considered than it deserves, it requires to be more fully illustrated.

Any one may ascertain by an easy experiment, that nearly

the whole of the useful principles contained in well fermented dung, may be extracted by repeated washings. When a considerable quantity of any Manure therefore, is laid upon land, and ploughed in or mixed with the whole soil, a great proportion of its richest salts will be carried down by the rains, and by that means will not only be lost to the present crop, but, if the sub-soil is of a loose and porous nature, will very soon escape beneath the reach of the plough.

Were a contrary system adopted, were stable dung and allenriching Manures mixed with lime or other active substances into the form of a compost, and in that shape employed either as a top-dressing, or very near the surface, a much less quantity than is usually applied might probably be found sufficient.

By laying Manures upon or near the surface, they would sink by slow degrees, their beneficial effects would be exerted upon the plants in their passage downwards, and very little, if any, of them would penetrate deeper than they could be useful.

It is highly probable, therefore, though not yet fully ascertained by experiments, that a much less quantity than what is usually ploughed in, if applied as a top-dressing, would produce effects equal, to those arising from the present way of manuring.

But supposing that one half should be required to produce the same effect, the benefit resulting, even from this difference, will be strikingly obvious. It will no doubt be said, that additional labour will be requisite to prepare and spread top-dressings; and that after all their effects will not be so permanent as in the common way of ploughing in the Manure. These objections however, will, we trust, have little weight. The first is, indeed, easily obviated; for if a given quantity of Manure is made upon the farm yearly, and the whole of it be laid upon the soil, it is a matter of little consequence whether it is spread upon one, two, or three fields; the expence of carriage will be nearly the same in almost every instance, and the only difference will consist in a small additional outlay for spreading, which will require to be done with more attention when top-dressings are employed, than when the Manure is ploughed in; of course less will

be spread in a given time, and more hands will be required to spread it.

The objection to top-dressings not having permanent effects is, to appearance, better founded; and certainly, at first sight, most people would be inclined to smile at the idea of one cart load of manure producing as much benefit as two. But as we have formerly taken notice of the proportion of dung that is buried, and lost, we need no farther argument to prove that a half, properly prepared, and carefully applied, will be equally useful as double the quantity, differently treated. But allowing the objection to be solid, which is by no means the case, when we reflect upon the difference between manuring 50 acres, or 100 annually, and take into account the increased produce in grain, and the increased bulk of straw and fodder which is to form an additional quantity of Manure for the ensuing season, we will be convinced that the advantage arising from using top-dressings, if judiciously followed, will be extremely considerable.

The only instance, in which the effects of top-dressings can possibly be lessened, will be in dry seasons, when a violent and long continued drought sets in immediately after they are spread. This certainly is sometimes the case; but in general the first gentle shower that falls insures their operation.

The successful practice of many of the most intelligent farmers in the island, particularly those of Hertfordshire, Berkshire, Bedfordshire, the West Riding of Yorkshire, &c. might here be dwelt on.* With them, top-dressings are in high repute, and experience has fully convinced them, that there is no mode of applying Manure equally profitable. The particulars of their practice shall be stated in the Appendix. But while we are

* These top-dressings not only supply the want of previous manure, but also when crops are sickly and backward in the spring, occasioned either by bad seed times, frosts, or other causes, are attended with wonderful success, and enable the crops to vegetate quickly, and to cover and protect the soil on which they grow from the ensuing droughts of summer. To their almost magical powers, the Hertfordshire farmers are principally indebted for their never failing crops. Without entering into any chemical analysis to discover

happy to bear testimony to this excellent husbandry, and the perusal of the Agricultural Reports before us furnishes many instances of it, it is with pain we observe, that in a multitude of other cases, no such thing as top-dressings or even composts are thought of; for notwithstanding the striking advantages arising from an attention to these points, the subject of Manures is still considered by too many farmers as a secondary object; and much less care has hitherto been paid to collecting, preparing, and employing them in a proper manner, than they deserve. A considerable quantity is daily lost about every farm, that might otherwise be saved, and a very great proportion of what is collected is of little value, owing to the careless, slovenly manner in which it is treated. Fermentation, it is well known, is essentially necessary to convert all animal and vegetable substances into good Manures; but in too many instances this is never once thought of, nor is it a matter of inquiry, with such farmers, whether the small quantity which they have collected, in perhaps a very slovenly manner, is fermented or not. At a certain season of the year, and that often an improper one, it is laid upon the field; and the poor returns that are made afford the most striking proofs of this execrable management.

It might naturally be supposed, that such farmers, by comparing their own miserable crops with those of their more intelligent and industrious neighbours, would be led to inquire into the cause of the difference. But so powerful is prejudice, and so obstinate and perverse is the human mind, when tinctured with par-

the cause, they are satisfied with the effects, and therefore continue to enlarge upon the practice, though attended with considerable expence. The provident farmer lays in a stock of dressings to answer contingencies, and provided with this treasure, he can remedy the evils of bad seed times and seasons. These top or spring dressings are peculiarly applicable to poor, light, sandy, and gravelly lands, and of course to the production of the specifically heaviest corn, and put such lands more on an equality in point of annual value, with stronger and richer soils. Happy would it be to more distant farmers, and agriculture in general, could an adequate substitute to the Hertfordshire dressings be procured at any expence, and were the application of that substitute perfectly understood. *Herts Report, p. 40.*

ticular notions, that few inquiries of this kind take place, and still fewer attempts are made to correct mistakes, however glaring, if sanctioned by long usage. Every improvement, either in the form of an instrument of husbandry, or in the manner of cropping and manuring, is considered as an innovation, and reprobated accordingly. Thus men grow old in error ! their children imbibe their prejudices, and follow the same path ; and the ignorance and want of system of the former generation, are quoted as reasons for the folly and obstinacy of the present. This accounts, in a great measure, for the slow progress of improvement ; and forms an obstacle, much more powerful than either a barren soil or a rigorous climate. To say more upon this subject seems unnecessary ; we shall, therefore rest satisfied with pressing the foregoing considerations upon the mind of every intelligent farmer ; for to such only are they addressed.

A mistaken opinion has long prevailed with many farmers, that if dung has only the appearance of being rotten, its effects will be equal to that which has been properly fermented. This idea, has been productive of much mischief. Some, indeed, carry it so far as to affirm, that dry straw, left in the field will be converted into good manure ; and trusting to this, they leave the stubble very rank, expecting to reap the benefit of it in the next crop. It is true that straw when left in this way, will decay, but surely if it had been mowed and collected into the straw-yard, it would have become doubly valuable.

Instead of a practice which has at least the appearance of negligence, every farmer ought to collect his straw with the utmost care, and endeavour, by every means in his power, to subject it to the process of fermentation, for in that way, alone, can it be rendered useful, and if proper attention is paid to cutting low in harvest, and leaving as little stubble as possible, one-third more straw at least may be got, in many parts of the kingdom ; by which a very important addition would be made to the Manure annually collected.

CONCLUSION.

The attention which other nations have paid to Manure, is well worthy the imitation of a British Agriculturist. The Romans, a nation of heroes, many of whose ablest generals held the plough, who, amidst the shouts of victory, wisely considered the character of being a skilful husbandman as their highest praise, could not have raised a sufficiency of food for themselves and their families upon their small patrimonies, without bestowing great care in collecting, preparing, and employing the different Manures, with which they were acquainted, an article indeed for which the farmers of ancient Italy in general were peculiarly distinguished.* The husbandmen of Flanders, in modern times, have rivalled them in this respect. But, perhaps, both are surpassed by the Chinese, who carry their attention to the article of Manure to a height hardly to be credited, without which, however, even that country, fertile and productive as nature has made it, could not maintain, perhaps, one half of its present inhabitants.

From the perusal of the Agricultural Reports, it appears, that calcareous substances are more generally used in Britain, than, it is believed, in any other country in the world. From the want of system, however, in the mode of application, so evident in many parts of the kingdom, their benefit is, in some cases, entirely lost; and in others they are supposed to be productive of mischief: but as their value is now completely ascertained, there is reason to hope, that science and attentive observation will soon fix a standard for their use.

In regard to the application of Enriching Manures, Composts, and Mixtures of Soils, there are perhaps few articles in which the British husbandmen are more deficient; while at the same time, there is none to which so much attention is due. But as a mi-

* So important was the discovery of Manures considered by the ancients, that they ascribed it to Saturn, the common parent of all their deities. Macrobi. Saturn. l. 1. c. 7.

adequate inquiry into the nature and effects of the different kinds of Manure, may not prove interesting to every individual who may peruse this Report, a separate discussion upon each article, will be found in the Appendix to this Chapter; to which the reader is referred.

Perhaps some might here have expected an explanation of the doctrine of Manures, on chemical or philosophical principles. But though many respectable philosophers have made various experiments, and some of them of importance, no complete system has hitherto been established: and as such disquisitions are not essential in a work calculated for real use and practice, it is therefore thought most advisable, to decline entering into questions of that nature, unless where they come necessarily under review in the course of explaining the nature and operations of the different Manures as they are treated of in the Appendix.

OUTLINES
OF THE
APPENDIX
TO THE FIFTEENTH CHAPTER, OF THE
PROPOSED GENERAL REPORT
ON THE SUBJECT OF
MANURES.

INTRODUCTION.

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THE object of the following observations, is to give a detailed account of the whole of the substances at present in use, or that are likely to be rendered useful, as Manures; to explain their properties, as far as we are as yet acquainted with them, to notice the present mode of collecting, preparing, and applying them, to point out the defects of each, and to lay down a set of general rules for their better management in future. In doing this, we shall endeavour to give as complete an account as possible of the nature, and mode of using each article by itself; so that the reader will find every thing that is necessary to be known upon any particular substance, under its proper name. The general list of Manures having already been given, it is unnecessary to recapitulate them. It is proper, however, to observe, that the same order which is there laid down, will be followed in this Appendix.

I. DUNG OF QUADRUPEDS.

The dung of quadrupeds is the most common, the most useful, though not perhaps the best managed of any Manure that is at present known. Previously to entering upon the way of using it, we trust a few observations upon the present defective mode of treating it, together with some account of its properties, the means of collecting, preserving, and subjecting it to the process of fermentation, and of increasing its quantity, will be thought of service.

Mode of Management at present.—When any considerable quantity, either of stable dung, or mixture of animal and vegetable substances, are collected together under certain circumstances of *heat, air, and moisture*, they begin to ferment, and exhibit all the different phenomena of fermentation, in a greater or less degree, till the process is finished. If we then examine the mass, we find that the vegetables of which it was originally composed, are decomposed and reduced to their first principles, and are again in a situation to afford food for new plants; by this means a perpetual succession is kept up, and the decay or death of any of these, which at first view we might be led to consider as a misfortune, serves for their reproduction.

This point settled, it will readily be admitted, that the more completely such substances are subjected to the process of fermentation, the greater and more beneficial their effects will be upon the soil. It is, therefore, an object of the first importance with every person concerned in the cultivation of the earth, to manage their Manures in such a way that they may be completely fermented, and to have their dunghills so situated and constructed, as to promote fermentation, and preserve the useful articles contained in the dung, both while the process is going on, and after it is finished. A careful attention to these points will not only improve the quality, but, as we shall afterwards see, increase the quantity of Manure in an astonishing degree.

When fermentation has taken place for some time in a heap of Manure, consisting either of animal or vegetable substances, or a mixture of both, the first alteration that is observed, is a change of colour and a sensible diminution of its bulk, as the process advances the bulk continues to diminish till the fermentation entirely ceases. This diminution, is owing to the solid parts of the mass being brought more closely together. The fixed air and volatile alkali escape in the form of vapour, and the moisture falls to the bottom, where it either remains, if the dunghill is situated in a hollow, and has a bottom capable of retaining moisture, or runs off if it is situated upon a declivity. When this moisture is collected and carefully analyzed, it is found impregnated with the salts contained in the dung, and if spread upon the soil in that state, it will contribute to fertilize the land.

In collecting and preparing this Manure, little attention has hitherto been paid, either to the site of the dunghill, the encouragement of fermentation, or the preservation of the salts after the fermentation is finished. Throughout the greatest part of Britain, it is painful to observe the neglect of this important article, particularly in those parts of the country, which, from their situation, are in a great measure deprived of every other means of improvement. Throughout the whole of North Wales, Cornwall, Cumberland, Westmoreland, and in short all the hilly and mountainous parts of England, this defect is common; nor is it less so in the Highlands and most of the upland districts of Scotland. In those parts the dung is generally thrown into the farmer's close, without considering either the nature of the bottom, its capacity for retaining moisture, or the chance there is of that moisture being drained off, if the dunghill is situated upon a declivity.

Accordingly we observe the greatest part of dunghills, either situated in hollows, and surrounded with water, which by chilling the mass very effectually prevents fermentation; or upon declivities, where they are totally exhausted of every drop of moisture. In these cases the dung is thrown out carelessly. Horses, cattle, hogs, and poultry are allowed to trample upon and spread it, and even carts and waggons are drove over it.

By this treatment it is pressed into a mass, too heavy and compact for the air to penetrate through a great part of it; the sides of the dunghill is scattered about, loses its moisture, and is either blown away by the winds, or returns to a state little better than dry straw, and when the season arrives for laying it upon the land, the whole is generally taken out, without considering whether it is fermented or not.

Defects of this Management.—To a person who has paid any attention to the subject, the defects of this management must appear in a very striking point of view. The middle of such a dunghill, from being hard pressed, will be long in fermenting, and even in the end be very imperfectly fermented, and the sides, from being scattered about and dried, will not be fermented at all; we need hardly observe, that the consequences of this management will be a scanty crop, and disappointment to the farmer; this is the ordinary effect where dung is laid, even upon a plain surface.

Bad effects of Dunghills being placed in a hollow.—When the dunghill is situated in a hollow, and has a bottom capable of retaining moisture, the consequences are equally bad, if not worse. The whole of the rain that falls immediately from the clouds, together with the water from the roofs of the surrounding houses, and the natural moisture of the dunghill itself, lodge there and chill it so as to prevent fermentation. It is certain that stable dung, in such situations, will have the appearance of being fermented, but upon examination it will be found only decayed; and from its being steeped so long in water, the greatest part of the salts will be extracted, and what remains, if carefully analyzed, will be found to contain scarce any other principle but vegetable earth.

Loss attending Dunghills being situated upon a declivity, or a gravelly bottom.—Where a dunghill is situated upon a declivity, or has a gravelly bottom, the loss is equally great, as in the two former cases; as the whole of the natural moisture that is pressed out during fermentation, and which is strongly impregnated with the salts of the dung, either runs off or sinks into the earth; nor is this the only loss that is sustained, every shower that falls, by passing through the mass, carries off an additional quantity of the salts, till by repeated washings, the dunghill is left in nearly the same situation as tea leaves after a strong infusion has been drawn from them.

Finally, by throwing it out in the careless manner already described, taking no pains to lay it up regularly, and allowing cattle, &c. to tread upon, and carts to pass over it, fermentation is long in taking place; even then it is partial and incomplete, and in place of producing good Manure, abounding with rich, well prepared substances, it will for the most part be found to consist of articles only half fermented, which from their parts not being properly separated, are very ill calculated to promote vegetation. Dung is the most likely to be best, where the dunghill is upon level ground, and at some distance from the offices.

Having mentioned the present mode of collecting and preparing stable dung, and stated the *slotbful* and *defective* manner in which it is generally done; we shall now proceed to offer some directions, as to the methods of promoting fermentation, and preserving the salts after the process is finished; and lastly, of increasing the quantity of that valuable article.

To promote Fermentation in Stable Dung.—To promote fermentation in stable dung, two things are essentially necessary, namely, air and moisture; without those

no fermentation will take place, and unless they are in due proportion the process will be incomplete.

It is a circumstance well known to persons who are accustomed to prepare dung for hor-beds, that by laying it lightly together in heaps, and watering it gently, fermentation is immediately brought on. It is also known, that in the after stages of this business, hor-bed dung is as completely fermented in the space of fourteen or sixteen days, as that in a farm-yard generally is in six or eight months.*

Every farmer ought, therefore, to imitate this practice as nearly as the nature of his situation will admit, and in place of having his dunghill in the stable-yard, and allowing carts, cattle, hogs, poultry, &c. to trample upon and disturb it, he should place it in some distinct situation, convenient for his offices, the urine from which should run into receptacles, from which it might be thrown, without the trouble of carriage, into the dung, where it would be of the utmost use in promoting fermentation.

When it is driven to the dunghill, the cart, or waggon, in which it is carried, should not be drove over the dung, as is commonly practised; because as we formerly observed, the feet of the horses and the weight of the carriage will press it so hard, that the air will be in a great measure excluded, and by that means fermentation prevented. It is disgraceful to see the common way in which this is done; the dunghill is for the most part in the form of an inclined plain, up this ascent, which when the quantity of dung is great, is sometimes very steep, the cart is driven, and while the wheels are sunk nearly to the axles, and the horses are sunk above the knees, the merciless driver exercises his whip, and occasions the most cruel and painful exertions to the poor animals, straining their bodies, and destroying the harness more in the course of a few yards, than driving the same load would occasion, in five or six miles.

If we inquire either of the farmer or his servant, what is gained by this exertion? he will only be able to say, that the load is laid upon the top of the heap, a labour which a man could readily perform, to much better purpose, in a few minutes.

The whole cart load ought to be laid down by the side of the dunghill, and afterwards thrown lightly upon it with a fork, the trouble of doing which would be trifling, and the advantage immense.

If dung laid up in this way contains a sufficient proportion of moisture, it will immediately begin to ferment, and the process will be soon and completely finished: particular attention ought therefore to be paid to this circumstance; and it at any time the dung is laid up dry, it should be immediately watered. In summer this will frequently be found necessary, especially during dry weather; and as most farms possess a sufficient command of water, it can very easily be done.

Where this method is had recourse to, the dung will be completely fermented in the space of six or seven weeks,† at the utmost, and in general will be found of one half more value than that which is made in the careless slovenly manner we have described.

* See Foot's *Middlesex*, p. 11.

† A very intelligent Agriculturist recommends that no more than what can be collected in a month, should be formed into one dunghill. After the end of the month it should all be turned over, and thoroughly mixed, and left to heat again for another month, and turned over again; when it will be fit for use.

Situation and Construction of Dungbills.—The importance of good Manure to all agricultural operations is such, that we should naturally have expected to find every thing relating to it made a primary object with farmers. On the contrary, no part of the rural economy has been less the subject of inquiry: the situation and construction of dungbills in particular, though highly deserving of notice, have for the most part been considered as a matter of indifference.

As was formerly mentioned, a hollow is improper for the site of a dunghill, from the circumstance of its lodging water, and preventing fermentation; a declivity is equally bad, as it serves to drain and carry off the moisture saturated with the richest salts of the dung. A gravelly bottom is worse than either of those, as the moisture sinks down into the earth, and is irrecoverably lost.

Proper Situation for a Dunghill.—The situation best calculated for the site of a dunghill, is that which is nearest to a level, with a bottom capable of retaining moisture, and if possible covered with a shade. The whole should be inclosed with a wall of at least four or five feet in height, with an open space at one end for carting away the dung. If the bottom is not clay, it should be laid with it, and paved above either with broad flags, or the common paving stones used for streets. At the end opposite to where the opening is left, a reservoir should be dug, which might either be lined with clay, and built round with stones, or fitted with a wooden cistern made water-tight, into which a pump should be put for drawing off the moisture daily.

This reservoir should be situated at the most depending part of the dunghill, with an opening in the wall immediately opposite to it. The pavement should have a number of channels of at least five or six inches deep, and the same width, all tending towards the opening; these channels should be well paved, and filled with brushwood before the dung is laid down, by which means they will be kept open, and the moisture find a ready passage to the reservoir. For better explaining the idea, we refer the reader to the annexed plan of a dunghill, with the proposed channels and reservoir.

PLAN OF A DUNGHILL,

WITH THE PROPOSED CHANNELS AND RESERVOIR, ON AN IMPROVED SYSTEM.

FIG. II.

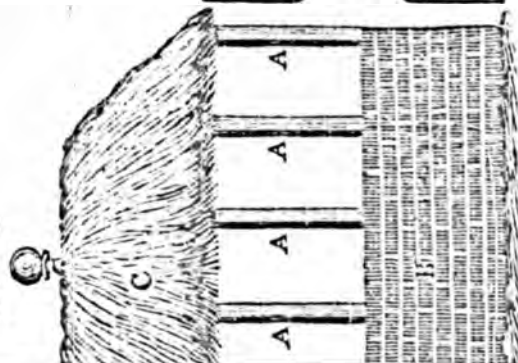


FIG. III.

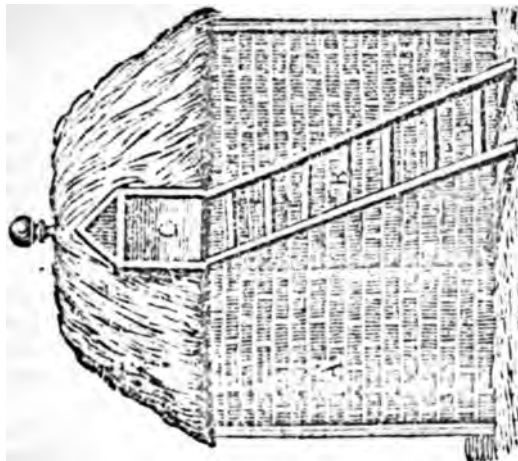
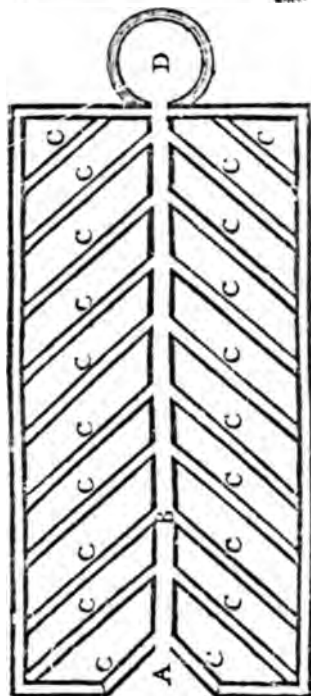


FIG. I.



EXPLANATION OF THE FIGURES.

FIG. I.

Represents the north view of a dunghill surrounded by a wall, to the height of five or six feet, and covered with a roof, which is supported by pillars on three sides.
A A A, &c. the pillars, which may be either of wood or stone.
B, the wall, which should be at least five or six feet from the ground.
C, the roof.

FIG. II.

Represents the south view of a dunghill, the south side being a solid wall, without pillars, from top to bottom.
A, the wall.
B, a ladder leading to the top.
C, the door entering to the roof.

FIG. III.

Represents the south view of a dunghill, the south side being a solid wall, without pillars, from top to bottom.
A, the wall.
B, a ladder leading to the top.
C, the door entering to the roof.

Every dunghill ought to be so situated as to have its longest sides run from east to west; surrounded by a wall, and covered with a roof. The wall on the south side of the dunghill should be of such a height as to prevent entirely the sun's rays from touching the dung; on the other three sides, however, there is no necessity for its being so high, six feet from the ground will be quite sufficient, and the roof can be supported by pillars, as in the *figure*.

The expence of a roof, which need only be thatched, will soon be compensated not only by the superior quality of the dung, but by the conveniences which it will afford, as it may easily be converted either into a pigeon-house, a poultry-house, or a store for the smaller husbandry utensils. The perpendicular wall on the south side will very effectually prevent the sun from depriving the dung of its natural moisture.

Advantages attending Dunghills constructed in this way.—The advantages attending this sort of dunghill will appear at first sight: the wall, by confining the dung, will keep it from being scattered about and lost, and will also preserve the sides of the dunghill from being dried, and rendered useless by the action of the air. The shade will keep it from being chilled or deprived of its salts by the rain passing through it, the wall will also prevent the moisture from escaping at the sides, and conduct it to the bottom. The pavement will prevent it from sinking into the earth, and the channels will conduct it to the reservoir, from whence it can be drawn by a pump into a barrel placed upon a cart, and either spread immediately upon the field, or mixed with other substances into a compost, or thrown upon the dunghill itself, it being the best of all ferments.

To increase the Quantity of Manure.—The quantity of Manure may be increased in various ways, one of which has already been noticed, viz. securing the moisture that drains from the dunghill, and either spreading it immediately upon the soil, or mixing it into composts; another method, by which an almost equal quantity may be obtained, is by collecting the urine of the horses and cattle in the stables; this may be done with great ease, by having a barrel or cistern sunk at each extremity of the stable, with a well paved channel leading to it.

Another means of increasing the quantity of Manure, is by gathering the dung of both cattle and horses that are feeding upon rich old pastures. Lands of this description need no dung, and the quantity that is annually dropt upon them, if carefully gathered, might be profitably employed upon the lands that are in tillage; upon poor pastures, however, this should not be practised, as a considerable part of the benefit such lands derive from being in grass, is from the dung of the grazing stock; but even upon these poor pastures the dung should be gathered off some places, and spread upon others, as there are particular spots in all fields to which the cattle resort, either for shelter, or because the herbage is sweeter; upon these parts much more dung is dropped than the land requires: it ought, therefore, to be carefully gathered and spread upon the poorest and least frequented parts of the field. Where labour is low, and it is difficult to find constant employment for the poor, this plan might certainly be adopted.

The substances that have been found, from experience, best calculated to increase the quantity of Manure, are earth, moss, turf, the shovelings of highways, and the cleanings of ditches or drains; one or all of which may be found, in considerable quantity, upon every farm if carefully sought after. There are two ways of rendering

these substances useful; the first is by laying them in the bottom of the dunghill, and suffering the moisture of the dung to soak down and saturate them; the second is to lay them in heaps by themselves, and collect the moisture of the dunghill and the urine of the cattle, and pour it upon them; in either of these ways, if proper care is taken, any of the substances we have mentioned will produce effects equal to the best Manure; and if the whole of the urine and other excremental matters about every farm is collected and used in this way, the quantity of that sort of Manure may be more than doubled in almost every instance.

Ordinary way of employing Stable Dung — Stable-yard dung is applied indiscriminately upon all soils, at all seasons of the year, and for every different crop; we have already noticed the loss attending the present mode of collecting and preparing it, and if we follow the farmer through the subsequent steps of his operations, we will discover that the system is equally erroneous and absurd; of all the Manures at present in use, none can be considered as so immediate a food for plants as stable dung, and when it is applied to vegetables in a growing state, this is strikingly exemplified, as they immediately begin to thrive, and continue to do so throughout the season. If this is admitted as true, and perhaps few will controvert it, how absurd must it appear to see farmers laying great quantities of rich well prepared dung upon their fallows in the end of autumn, there to remain till the ensuing spring before the plants require the use of it, for if the fallow is sown with wheat, or any other crop that is to stand the winter, during a considerable part of that time the growth of the plants will be stationary, consequently they will need no nourishment; indeed if they only vegetate and establish themselves in the ground before winter, that is the utmost that can be expected. In the mean time it is worth while to inquire what becomes of the dung. If it has been well fermented, the useful salts contained in it will dissolve very readily in water, and as it is doomed to remain in the earth during the whole of the winter months, a period during which the greatest quantity of rain falls, every shower will deprive it of something, and when the spring arrives, and the plants begin to vegetate, a great part of what was originally destined for their nourishment will be discovered to have been washed away and lost by the winter's rain.

This is the first loss that attends laying dung upon fallows in the autumn, and when duly considered, it will be found a very serious one; the other disadvantages attending the practice are equally great: where fallows have been well wrought, the soil is in general completely reduced, mixing it with dung in that state prevents it from acquiring a sufficient degree of compactness to shelter the roots of the plants. The operation of the winter's frost renders it still looser, so that in the spring it is found nearly in the state of a mole-hill; the baneful effects of this to a wheat crop are well known to every man of observation. Were a different method pursued, and at least a portion of the dung withheld till the spring, two very material advantages would accrue from the practice, the land would attain a greater degree of compactness, and would in general be found firmer in the spring, by which means the plants would be less liable to be thrown out of the ground by the frost, and if the dung were then applied as a top-dressing, vegetation would immediately commence, and the progressive growth of the crop would completely take up the useful parts of the dung every time it was moistened. In this shape, no part of it could possibly be lost, and from the small quantity that would be required for a dressing, three times the extent

of land might be dressed annually, and it would not require so much time or labour as might at first be imagined. In treating afterwards of lime, it will be laid down as a rule, that a complete dose should be given at once; with regard to dung, the reverse ought to be the case; lime being intended to operate upon the parts of the soil, unless a sufficient quantity is laid on, the whole soil will not be acted upon, consequently its effects will be small: but dung being a sort of ready-prepared nourishment for the crop, if it is either applied at a time when the plants are in a dormant state, as is the case with wheat in winter, or if more is used than is sufficient for the wants of the crop, in either case it is washed away by the rain, and lost; whereas were it applied in a quantity sufficient only for the nourishment of the crop, the plants would be fed in the same manner as the animal body, every small dose operating like a meal. In this way it is utterly impossible that any part of the Manure can be lost; for in the first place it is laid on when the plants have a demand for it, and in the second, by laying it upon the top, every drop of the moisture is interrupted in its passage downwards by the roots of the crop.

Dung upon Clover Ley in Autumn.—The practice of laying dung upon clover leys in the autumn, is equally absurd, for whether it is intended to continue the field in clover for another year, or to plough it down for wheat or oats, the mischief is great.

Where it is intended to let the field remain another year in grass, a very material injury is sustained, a part of the dung is in the first instance washed away by the winter rains, and the remainder, in place of serving, destroys the plants; it being now well ascertained, that the action of dung upon broad clover, when the plants are not in a growing state, is fatal to them, in this case the farmer has the mortification of seeing not only his dung thrown away, but his crop lost.

But while we reprobate the laying dung upon clover before winter, we entertain a very different opinion of it, when used early in spring. At this season a light top-dressing of dung is highly useful to broad clover, and what is singular, the same plants that would have been killed by its operation if laid on about the end of autumn, will be rendered strong and vigorous by using it in the spring: let theorists account for this in their own way, the fact is incontrovertible.

Dung upon Clover Ley for Wheat.—Dung is frequently laid upon clover ley for wheat, and the seed put in upon one furrow. In speaking of the practice of laying lime upon clover leys for oats, notice will be taken of the loss sustained, by the lime being buried. The same objections apply to dung when used in this way, for if the grass crop has been good, or even tolerable, the furrow will be turned over entire and the dung laid flat under it, and as the roots of the wheat must penetrate through the sod before it can reach the dung, little benefit can be expected from it, even allowing the qualities of the dung to remain unimpaired; but, as was formerly observed when speaking of the loss attending its use upon fallows, the greatest part of it will be washed away by the winter rains; indeed in this case the loss will be greater than when it is laid upon fallow, for there it is incorporated with the soil, and a part of its salts will at least be entangled amongst the earth; but upon ley it is either laid in the bottom of the furrow, or if the sod is set up on edge, it remains crammed into the interspaces through which the whole of the rain passes that falls upon the field; for when a shower falls upon a field of ley that has been recently ploughed, in place of every drop sinking down where it falls, as is common upon other lands, the plexus

formed by the roots of the grass, together with the polish given by the plough, renders the body of the furrow so compact, as to make it in some measure impervious to water; in that case the rain which falls upon the body of the furrow in place of penetrating it, will run off and sink down into the interspace, where it must necessarily pass through the dung, and in its passage will dissolve and carry down a part of the salts during the whole winter; this will happen every shower: and in the spring if some of the dung that has lain in this situation is taken up and examined, it will be found nearly destitute of every fertilizing quality; upon this abuse we think it unnecessary to say more. Perhaps wheat should never be sown upon clover leys, an oat crop is in general more valuable, and the land is left in a better situation after it; but if wheat is ever sown upon ley, the dung ought to be used as a top-dressing in the spring; by applying it in this way every part of the crop has the benefit of it, and as we observed, when laid upon fallow no part of it was lost, so neither can it be in this case, the operation of the harrows will have loosened the top of the furrow so that the moisture of the dung will readily enter it, and nourish the plants. Wet weather in the spring, will interrupt the laying on the top-dressing upon leys that have been ploughed the preceding autumn, much less than either upon fallows or any description of land, as the cohesion of its parts is such, that it will be able to support the weight of the carts at any time, except after a very great fall of rain.

Loss attending the use of Dung upon Ley for Oat Crops.—The objections that have been made to laying dung upon ley for wheat, apply equally to oat crops, with this additional one, that if the land has been well laid down and the grass good, there is an absolute certainty of a good crop of oats without dung. It may not be improper to observe, in this place, that the oat is a grain which requires lime or dung much less than almost any other, as we daily see tolerable good crops of oats raised, without the assistance of either, and that too in situations where no other sort of grain will grow; the use of dung upon ley for oats is therefore unnecessary; but if the land is poor, and dung is required, it is impossible to employ it in any way that it will be so useful, as in the form of a top-dressing, at the time the seed is sown. When used in this way, there is an absolute certainty of the crop reaping every possible benefit from it, and even of the soil being enriched. When ploughed in, none of these are answered to equal advantage.

Application of Dung for Turnips and Potatoes.—Perhaps there is no way in which dung is used where its effects are so certain and visible as upon potatoes and turnips, the principal reason of this is the season at which the dung is used; for potatoes it is laid on when the spring is pretty far advanced, after which there are few heavy rains, of course the strength of the dung is not impaired by washing, and the crop is left in quiet possession of the whole of its fertilizing powers. For turnips the case is nearly the same; indeed the advantage is still greater, as dung is never laid upon turnip land sooner than June, after which there is seldom much wet weather till autumn, and by that time the crop is in full vigour.* These two instances of the certain effects of dung, are mentioned merely with a view to shew the propriety of using it at a season of the year when the crop for which it is meant is in a growing state, and can absorb the useful parts of it. There is scarce a single instance of its failing (unless

* See Northumberland Report, p. 37.

from bad seasons) when applied in this way, on the contrary, when used in the autumn it is often lost.

Dung upon Meadows.—Farmers differ as to the proper time of laying on dung upon meadows. Some prefer the spring, producing, they assert, an early vegetation, and a plentiful crop. But others are of opinion, that though dressings of soot and fine ashes, at that season of the year, are of much use, yet that dung ought to be laid in the end of autumn, so as not to taint the juices of the ensuing crop.

The above comprehends nearly the whole of the different modes of using stable dung, in considering which we have freely pointed out the abuses that prevail in the present system, and attempted to lay down rules for better management in future; we shall now conclude the article with some directions about separating the different sorts of Manure made about farms, and a few observations by way of a result from the whole.

Farmers ought to have several Dungbills.—Perhaps there is nothing that calls more loudly for reform than the custom most farmers have of collecting Manure of every description, and laying it up in one dunghill. By this mode of management substances very opposite in their nature, and which may be wanted at different times, are laid together, and in place of forming *useful* combinations, they are prevented from fermenting, and being rendered useful. We would therefore propose to every farmer to have at least two or three dunghills, in which, according to the time at which the contents of each may be wanted, and the articles of which they are respectively composed, they may be prepared for use.

If *earth, moss, or the shovellings, of bigbways*, can possibly be procured, the bottom of any dunghill in which either rank stable dung, or short excremental dung may be laid, should be covered to the depth of three or four feet with these substances before any of the dung is laid on. This method, if properly followed, will increase the quantity of Manure considerably, for while the fermentation is going on, the moisture that is pressed out during the process will sink down into the *earth or moss*, and impregnate it completely with the salts of the dung; and if the whole is afterwards turned and incorporated, the earth or moss that was laid in the bottom will be found of nearly equal value with the dung itself.

Different kinds of Animal Dung.—Some distinctions are to be made regarding the various sorts of animal dung.

1. Horses. The dung of horses is more distinguished for the readiness with which it ferments, than for its intrinsic richness. In its raw state, it is well calculated for potatoes, leaving room in which the roots of that plant may expand; but, unless when fermented, it is apt to produce any sort of weeds, the seed of which may have got into the food of the animal, as it contains much undigested vegetable matter, and should never be used but when fermented.

2. Black cattle. The dung of black cattle is the most useful, particularly for lean, dry, or sandy soils. It is held, that the dung of a ruminous animal, as an ox, is preferable to that of horses at grass, owing to the quantity of animal juices mixed with their food in chewing; * not containing much undigested matter, it will hardly heat. It would be of use, if means could be found to make it ferment like horse-

* Hunter's *Georgical Essays*. Edit. 1777, p. 17, &c.

dung. The best way of managing it, is to lay it together, and keep it moist till it is sufficiently putrified.

3. Sheep. The dung of sheep by itself, is an excellent Manure. In Holland it is collected on the fields, carefully cut into small pieces, and sold in baskets at a high price. Its use, when sheep are folded, will be afterwards considered.

4. Hogs. Swine's dung, in the opinion of Dr. Hunter, is the richest of the animal Manures. It is commonly asserted that the tatter the animal, *cæteris paribus*, the richer the dung. Hence arises the superiority of this article. It is of an oily and saponaceous quality, and when made into a compost and applied with judgment, it is excellent for arable lands.

5. Rabbits. It appears on the authority of a fact, stated by Mr. Arthur Young,* that the dung of rabbits is even superior to that of pigeons, and lasts the longest.

We shall now conclude this article with the following observations. 1. That as animal dung in general, contains more oil than alkaline salts, that it is best calculated, when used by itself, for chalky, limestone, or gravelly soils. 2. When used as a compost, that it should be mixed with earth and lime. 3. That it should be completely fermented, before it is made into a compost. 4. That when mixed with earth and lime, it is exceedingly proper for all deep soils. 5. That whether it is used as a compost or by itself, it may be applied with much advantage as a top-dressing. 6. That as a top-dressing, it ought never to be used but in the spring season. 7. That it may be applied with the greatest benefit when the crop is in a growing state, and can absorb and take up the nourishment it contains.

II. DUNG OF BIRDS.

Pigeons' dung is certainly a rich Manure, but the effect is sudden, and as it does not last long, it must be the oftener renewed. It is most applicable to cold and deep stiff land. Sometimes it is sown upon wheat crops in the spring. It should always be broke very small, and sown during moist weather, and if circumstances will admit of its being harrowed in, so much the better. Poultry Manure is of the same nature, and where it can be had in any quantity, is an excellent dressing, particularly for cold land. Columella ranks it next, in point of value, to the dung of pigeons.

III. NIGHT SOIL, OR PRIVY MANURE.

All excremental matters are found to be excellent Manures, and if care were taken great quantities might be collected.

As it is perhaps the richest of all Manures, there can be no doubt of the farmers being so desirous of obtaining it; but on account of its richness, it ought to be used, when unmixed, in smaller quantities, at least a small quantity of lime thrown occasionally into the necessary-house would be great service. *Saw-dust, peat-moss, or*

* Northern Tour, v. I. p. 129. Edit. 1770.

any of the common soils will likewise be highly useful by absorbing the urine and moisture, which would otherwise run off into the common sewer. Where a certain proportion of lime is used, the excremental part will soon be deprived of its smell, and rendered so short and dry that it may with ease be employed as a top-dressing, or even used by the hand if properly broke; indeed it should never be employed in any other way, as it is by far too concentrated a nourishment to use by itself.

Two cart loads of ordure mixed with ten loads of earth, and one of lime, will be a sufficient top-dressing for an acre; its best effects, when used in this shape, will be upon light lands for wheat or barley; for wheat it should be used early in the spring, and for barley should either be scattered upon the young crop, or harrowed in with the seed. It is also particularly convenient for all drill crops.

IV. URINE.

Urine of every sort is found of great use when laid upon grass or young crops early in the spring. Applied in this way it never fails to produce a plentiful and early vegetation. The most convenient way of using it, however, seems to be in the form of a compost, with earth or peat moss, with a small proportion of lime. In this shape it will be found a good Manure for most soils, particularly light, sandy, or gravelly lands.

Great quantities of this article might be saved, and if judiciously used will insure at least one or two good crops; about all farms and great towns it may be collected into reservoirs, along with other excremental matters with very little trouble. In other countries this is an object of police, particularly in the towns where reservoirs are established in convenient places for collecting it. It is scarcely conceivable the advantage which the public receives from this arrangement. The neighbouring farmers carry it away in barrels, and either spread it immediately upon their fields, or mix it into composts with earth and other substances, and find it of the utmost service to vegetation: what might not be expected if the same attention was paid to collecting it over the whole of this kingdom?

V. BONES.

Bones are used with success as a Manure in many parts of England, both by themselves, and in conjunction with other substances. The ordinary way of treating them, is to break them, with a mill, into pieces about the size of a marble; they are afterwards laid upon the field in small heaps, at regular distances, and covered with earth, after remaining in this state for some time, they are spread on fallows, on grass, and on turnip land.

The constituent parts of bones are oil, alkaline salts, and animal earth, united by fixed air. The oil is in much greater proportion than the alkali, which renders bones rather a heavy Manure.

It does not appear, that much pains is taken in adapting them to the soil for which they seem best calculated, being laid indiscriminately upon lands of every description, and for the most part unmixed with any other substance. To a person acquainted

with the nature of bones, this management will readily appear defective, for as they are kept together by fixed air, unless they are either laid upon soils possessing principles that are capable of depriving them of this air, or have something of that kind previously mixed with them; the texture of their parts will remain unbroken, and they will be of very little use. In Hertfordshire, however, they are found an excellent Manure for clay soils.

Method of preparing Bones, previous to their being used. To render bones useful the first step ought to be, to grind them as small as possible, and the more thoroughly this operation is performed, the more valuable will be their effects. This point once gained, we must look for a substance that is capable of dislodging the fixed air and disuniting the principles contained in the bone. For this purpose nothing will be found so useful as quick lime.* In treating of that article, we will take notice of its quality of dissolving oils and fat substances, and that this quality is increased by its union with alkaline salts. This effect is produced by the lime depriving the alkali of its fixed air, and rendering it more caustic.

Method of using Bones.—When bones are used in their simple state, without the addition of earth or lime, they ought never to be laid upon any but the sharpest and most active soils, such as limestone, chalk, or gravel, upon all of these they will meet with more or less calcareous earth, which will, in some degree, disengage their fixed air, and dissolve the oil contained in them, but upon deep clays, tills, or loam, they should never be applied in that state, as these soils contain little calcareous earth, of course will have little effect upon any oily substance.

But when made into a compost in the manner we have directed, they may be applied with advantage upon soils of every description, taking care to observe the same rules as were laid down for using stable dung, that is, never to plough them in, but always to lay them upon or very near the surface, and never to use them but when the crop is in a growing state; for the effects of bones prepared in this way will be found not only more sudden, but their valuable qualities will be more in danger of being washed away by rain than in cases where they are used by themselves. They will therefore require to be laid on very thin, allowing, as near as can be ascertained, a quantity sufficient only for the nourishment of the present, or at most the succeeding crop, and never to use them for broad cast crops in any other form than a top-dressing, and at a time when vegetation is either about to commence or is actually going on. Upon wheat they should be used early in the spring without harrowing, upon barley or oats they may be harrowed in along with the grain.

For drill crops, such as turnips, beans, &c. they are particularly convenient, as they admit of being sown into the drill at the same time with the seed, more readily than most of the other Manures, and as we have already said, when speaking of stable dung, the less Manure that is laid between the drills, so much the better, as what is laid there is either lost or serves to nourish weeds, which the farmer is attempting to destroy.

* Mr. Paget recommends mixing them in a heap with lime, which soon reduces them to powder. Leicester Report, p. 19.

VI. PUTRID ANIMAL SUBSTANCES.

All animal substances in a putrid state, are good Manures, if properly managed; when used by themselves they ought always to be laid upon the sharpest and most active soils, such as chalk, limestone, &c. but upon strong clays, or deep loams, they should never be used but in the form of a compost.

Method of preparing putrid Substances for Manure.—The most proper way of preparing these for use is by mixing them with chalk or quick lime, the mixture should be laid in heaps of three or four cart loads each, and covered with earth; after remaining in this state for eight or ten days, the heap should be turned over, and about ten cart loads of earth added to every cartful of the former mixture. It should then be allowed to remain for a month in this heap, at the end of which time it will be ready for use.

Modes of applying this Compost.—This compost ought never to be ploughed in, but always used either as a top-dressing, or harrowed in along with the seed. Upon wheat in the spring it will be found a good manure; indeed upon every sort of grain it may be used with safety and advantage. It may likewise be used for drill crops in the same manner as was mentioned for bones.

VII. REFUSE OF SHAMBLES.

Much of this Manure might be collected about all great towns, where the refuse of slaughter-houses is frequently thrown away; which if gathered together and covered with earth and lime, would not only rid the inhabitants of a nuisance, which offends their senses and endangers their health, but would produce profit to the community.

VIII. REFUSE OF MANUFACTURES.

The advantage which agriculture derives from manufactures is in this respect particularly evident, that the refuse of such manufactures answers in general the purposes of Manure. Under this general head a variety of articles may be enumerated, as the refuse of wool, whether in rags or otherwise; if in rags, they should be chopped small, about an inch or two square, and scattered on the land before it is ploughed; when covered with earth they begin to rot, imbibe the moisture of the dews and rain, and keep light loose soils in a moist state—6s. per cwt. is supposed to be sufficient for an acre; and as even in the neighbourhood of London they may be had for 5s. per cwt. it is not an expensive Manure, could it be had in any quantity. In Berkshire it is used for dressing wheat and clover leys, and even upon light soils produces abundant crops.* Among other articles of the same sort, the following may be mentioned; namely, refuse of hair manufactures, refuse of horn, scrapings of oiled leather, shoemakers' chips, refuse of potteries, † slam, or the refuse of alum works, &c. ‡

* Berks Report, p. 25.

† See Letter to the Board, from Josiah Wedgwood, Esq.

‡ North Riding Survey, p. 52.

IX. RAPE CAKE.

Rape cake has of late years been much used as a Manure, both upon fallows for wheat and barley, and for turnip crops. The ordinary way of preparing it is by breaking it with a mill, and sowing it by hand before the fallows receive the last ploughing; in this way it has been of considerable service, but it is worthy of notice that as the valuable principle in this Manure consists of oil only, and that in a hardened state, it is much improved by being mixed with active substances, such as lime or alkaline salts, in order to make it act properly. When employed by itself, it answers best when laid upon sharp active soils, which dissolve it;* but if laid on heavy clays, or heavy loam, a great proportion of it will remain inactive in the earth, unless mixed with lime, &c. The observations that were formerly made with regard to the inactivity of animal substances, apply equally to rape cake; on heavy soils it certainly ought to be used in the form of a compost, either with alkaline salts or lime. If it is intended to be used as a hand dressing, six parts of rape dust and one of lime will make an excellent compost, and will produce certain and valuable effects; in this state it may be sown by the hand upon soils of every description. The lime should, however, be mixed with the rape dust at least ten days previous to its being used, and should be turned every day during that time. There is no crop for which this may not, with propriety, be used; taking care always to apply it when the crop is in a growing state, for when mixed with lime, the oil will be so much dissolved that it will readily mix with water, and the first shower that falls will either convert it into nourishment for the crop, if it is in a growing state, or carry it into the bowels of the earth, if the plants require no nourishment, which in the winter season, when their growth is at a stand, they do not.

If it is used for wheat, the spring seems to be the best time for applying it. At that season it will seldom lie long enough to be hurt for want of moisture, and the first shower that falls it will begin to operate; whereas by using it before the winter, at a time when the soil is drenched by autumnal rains, the greatest part of it is washed away and lost. For turnips and all drill crops, it can be employed with great accuracy and advantage; indeed there is hardly any Manure that admits of being so readily applied to all purposes. It is to be observed, however, that there is not the

* In a letter from the celebrated Dr. Hunter of York, it is stated that the farmers round Aberford, in the West Riding of Yorkshire, employ rape dust as a manure for their barley and wheat crops, their lands being in general a thin limestone, and consequently incapable of being ploughed deep. As the farms lie remote from any large town, it would be impossible for them to be cultivated in any profitable way were it not for the use of rape dust; and such is the extensive use of this kind of Manure, that within these 20 years, it has risen from 10s. to 18s. per quarter, and is still rising. The quantity used is three quarters per acre for barley, and four for wheat; it is sown by hand, and harrowed in with the grain: if rain fall within a week or ten days after sowing, the crop is generally good, but if no rain fall till long after, it is but little benefited by this expensive dressing, neither is the crop of the succeeding year benefited by it, as I am informed. For wheat, rape dust is considered as a certain dressing, rain generally falling within a short time after sowing that grain. The strong mechanical powers now employed in drawing the oil from the rape seed, must, as I conceive, diminish the goodness of the dust used by the farmer. However, some experienced farmers are not of that opinion, and say, that it is full as good as when it contained more oil: this deserves to be carefully investigated, and should be an object of correct experiment.

same necessity for making rape dust into a compost when used upon light soils; upon these it will generally meet with a sufficiency of active principles to dissolve the oil contained in it: accordingly the greatest benefit yet derived from this article when employed by itself, has been upon chalky and limestone soils.

X. OIL.

Oil has been frequently tried as a Manure by itself, though hitherto with little advantage; perhaps there is nothing with which we are at present acquainted, except iron, that will induce a greater degree of barrenness than oil, when applied upon particular soils, under certain circumstances. When applied upon lands that contain little calcareous earth, or alkaline salts, it covers, and, if we may use the expression, seals up every thing, so that no vegetation goes on, unless hemp or flax is sown, even then the crop is bad. The cause of this is evident, oil by itself is incapable of dissolving in water, consequently if the soil is filled with it without lime or alkaline salts, it will remain in a dormant state.

When oil is used as a Manure, it should either be mixed with lime or alkaline salts, and spread upon the earth in a liquid form, or made into a compost with lime and earth. With judgment and attention it may, in this way, be rendered highly valuable, and if due pains are taken to proportion the quantity of lime to the oil made use of, much advantage may be derived therefrom.

In the very remote parts of the country this article is worth attending to, as it is of easy carriage, and a small quantity of it will cover a great extent of ground; in its simple state it should never be used alone, unless upon the strongest chalk or limestone lands; even upon these we entertain doubts of the propriety of employing it unmixed. It certainly should, in all cases, receive some previous preparation; for that purpose none seems so proper as filling a large barrel churn half full of oil, and adding to it an equal quantity of strong ley of pot-ash, very hot; the churn should then be briskly agitated for some time; and if the quantity of pot-ash has been sufficient, the water and oil will be thoroughly incorporated. The churn should then be emptied, and about a fifth or a sixth part of this mixture put into it, and filled again with boiling water, and agitated as before; by this management the oil may be incorporated with any given quantity of water, and may afterwards be used, either in its liquid state, or mixed with earth or saw-dust. In this last shape it will be found a most excellent hand-dressing for sowing upon young crops. In whatever way it is used, it is of consequence to mix and dissolve the oil completely; for that purpose some attention will be necessary, as the success of the experiment will depend entirely upon the quantity of the pot-ash employed. A very simple experiment will illustrate this; put a given quantity of the oil that is to be used into a phial, with an equal proportion of water, take also a given quantity of pot-ash and add it to the oil and water by degrees, taking care to shake the mixture, every small addition that is made; as soon as the mixture attains a uniform milky appearance, the oil is sufficiently dissolved, and by weighing what remains of the pot-ash, the quantity necessary to be used may be very exactly ascertained. By attending to these points oil com-

posts may be made with great certainty ; without this attention they must always be faulty.

Oils mixed with animal or vegetable substances may be made to putrify, and then become a Manure.

XI. FISH.

All kinds of fish in a recent state contain nourishing substances in considerable quantities, and upon particular occasions, either where the quantity caught has been too great for the market, or when there has been a deficiency of salt for curing them, they have been occasionally employed as Manures, even in cases where the fish have been cured ; the offal is worth attending to, as it possesses a considerable proportion of nutritive principles ; but whether the whole of the fish or only the offal is employed, the management will be the same, as both possess too much oil to be useful as Manures, without the addition of some active ingredient.

The proper way of using fish seems to be that of mixing them into composts with other substances, for that purpose we are convinced that laying them in heaps for eight or ten days, till they begin to corrupt, and then mixing them with a quantity of earth ; when they have remained in this state for a couple of weeks, the heap should be turned, and a quantity of chalk or quick lime added, in the proportion of one cart of lime to three of the fish ; this should be allowed to remain for a month, and then turned, and as much earth added as will be equal to both the fish and lime. Herrings being the fish that is caught in greatest abundance, will be most frequently used in this way, either entire or their offal : in these situations, therefore, where they are in greatest abundance, it is of considerable importance to be able to use them to advantage.

A compost prepared in this way will be found an excellent top-dressing for any sort of crop, if applied at a proper season. For wheat, it used early in the spring, it will answer well ; or for barley either harrowed in with the seed, or applied upon the young crop. It may likewise be used for drill crops with great ease and accuracy.

XII. SEA WEED, OR WARE.

Sea ware is used as a Manure upon almost every part of the coast where it can be obtained in sufficient quantity, and wherever the practice prevails its effects are distinctly marked by producing early and luxuriant crops. In several parts of the kingdom the value of the land has increased in a sixfold proportion, from the circumstance of the occupier having access to this Manure ; in the county of Haddington particularly, there are several farms that were formerly let from 10s. to 15s. an acre, which are now rented at £2. 10s. and three guineas ; part of these lands are situated upon a dry limestone bottom, upon these the sea weed has produced the most surprising effects.

The common practice is to spread the weed immediately after it is brought from the shore, either upon the stubbles or grass lands. When laid upon the stubble, it is

generally ploughed in as soon as possible after spreading ; farmers who use much of it, never lay it in heaps to ferment, as they observe that both the quantity and quality are impaired by treating it in this way, so much so indeed that a load of fresh ware will be of more service, if laid upon the soil immediately after it is thrown out by the tide, than two loads when laid in a heap and left to ferment. In this respect sea ware and all marine plants differ from most vegetable and animal Manures ; to render the latter completely useful fermentation is indispensable ; the former, on the contrary, producing the greatest benefit in its recent state.

In most cases ware may be conveniently used in this way, for where a farm is under a proper rotation there will always be ground to lay it upon : during the winter months it may be laid upon the ley and stubble fields, and in the spring upon the bean and barley lands ; during summer the fallows will require all that can be collected, and by the time these are sufficiently manured, the clover fields after the first cutting will be ready to receive the remainder : through the autumn the stubble fields will require all that can be collected. Thus throughout the whole year this valuable Manure may be used as soon as it is thrown upon the beach, and experience sufficiently proves that its greatest value is in that state.

If, however, it should at any time happen that more weed is thrown out than can be conveniently used, it is an object of importance to preserve its qualities as much as possible. When it is laid up in heaps by itself, this cannot be done ; for as we have before observed, the quantity is not only diminished, but its valuable qualities very much impaired. The only probable way of preserving it seems to be by making it into a compost with earth, and a small proportion of lime. If the quantity of earth is great enough to absorb and retain the juices and salts of the ware, the proportion of lime moderate, and the whole thoroughly incorporated, and afterwards protected from heavy rains, it will be found nearly as valuable as in a fresh state, perhaps equally so ; but it must be observed, that if the compost is placed either upon a declivity, or has an open gravelly bottom, and is at the same time exposed to every shower that falls, its value will be small indeed ; for the alkaline salts and oil being completely dissolved and mixed with the earth, will be readily taken up and washed away by every shower that falls ; and when the farmer comes to use his compost, in place of finding it saturated with these rich principles, it will, upon examination, be found to consist almost entirely of earth ; in short every one of the precautions which we recommended in selecting a spot for the site of an ordinary dunghill, apply with equal, indeed greater, force to the present article, as its salts and oils are so much attenuated, that they dissolve in water more readily than even those of stable dung.

The method proposed for preserving lime will be found the best for securing this compost from the injuries of the weather. After they are properly mixed and prepared, to lay them up in the form of a ridge, with a pretty sharp angle at top, covered to the depths of two or three inches with earth, well beat with the back of a spade, and afterwards defended from the rains with straw.

This compost will be found a good dressing for young crops of every description, and may be used either at the time of sowing the grain, and harrowed in along with it, or after the plants have made some progress ; upon wheat it should always be used upon the young crop early in the spring.

If equal quantities of oil and water are put into a phial with a small proportion of

pot-ash, or fixed alkali, and the whole well shaken together, the oil and alkali will not incorporate with the water, but will float upon the top in the form of a white ropy mass; but if more alkali is added, and the glass briskly shaken, the water, oil, and alkali will be completely mixed, and assume the appearance of a uniform milky liquid. This experiment is a faithful picture of what happens upon many fields of rich deep land, that contain abundance of the principles of vegetation, but which from being unequally proportioned, remain inactive in the earth. It is bad husbandry therefore to lay sea weed, or indeed any heavy rich Manure upon such soils; lime, chalk, shells, &c. are the proper substances.

This article seems peculiarly adapted for lands that have been hurt by over-liming; the bad effects of which it will more readily correct than any other Manure, except oil and animal substances.

XIII. RIVER WEED.

River weed has hitherto been little used as a Manure, though some experiments that have been made entitle it to considerable notice.

Its effects upon wheat and the different sorts of grain, as well as upon turnips, cabbages, and other green crops, are well ascertained, and the facts stated so strong as to awaken the attention both of farmers and proprietors who have either rivers or lakes upon their lands.

In summer great quantities may be gathered, both in the lakes and those parts of rivers where the water is deep and has no current, and in all wet ditches. This article is used in various shapes, sometimes it is laid upon the land green, and ploughed in, at other times it is mixed with earth and dung. Its effects when ploughed in green last only one year, but when used as a compost along with other substances, they are more permanent.

The best way of preparing it for a Manure is to lay it in small heaps for a day or two after it is taken out of the water, in order to drain off the superfluous moisture; for if it contains too much of that, it will not readily ferment, and when fermentation does take place a considerable proportion of its useful parts will be washed away; having lain two or three days in this state, it should be put into large heaps, containing three or four cart loads each, and suffered to remain there till the fermentation is over, each heap should then have about three times the quantity of earth or mud mixed therewith, taking care to incorporate them well, and let them remain for a week or ten days, they should then be turned, and a quantity of hot, new slacked lime added, during the turning. In this way a compost may be made ready for use in a month.

This Manure seems well adapted for thin light soils, upon which it will always operate well, and from the quantity of rich vegetable earth which it contains, will thicken the staple of the land. Indeed it will be found valuable upon whatever soil it is laid, but should never be used in any other shape than a top-dressing.

XIV. MUD.

Mud, whether from the sea, rivers, or ponds, is an excellent Manure, and is used with much advantage upon all soils, both in its simple state, and in conjunction with lime and other substances. Its greatest value is upon thin soils, the fertility of which it increases amazingly, and at the same time adds to the staple of the land. Much of this Manure may be collected in the deep parts of rivers, in ponds, and in all stagnant waters; in particular situations great quantities of it are deposited by the tide, particularly where the sea has an ouzy bottom near the shore. In perusing the Agricultural Reports, several instances of the valuable effects of sea ouze or mud are mentioned from high authority.

This article, whether collected from ponds, rivers, or the sea, should always be made into composts, either with lime, chalk, or marl, or with lime and dung if they can be procured, and on no account should they be applied any other way, but as top-dressings, or very near the surface. For *wheat*, *barley*, and *clover* crops, it is highly serviceable, and has also been applied with success upon thin poor pastures.

There are two modes of making use of this excellent species of Manure. The first is usual in Yorkshire and Lincolnshire with what is called warp land, or land enriched with the sediment of rivers or arms of the sea, when the banks are overflowed.* This generally takes place in the winter or early in spring; it is impossible, therefore, in such fields to venture to sow wheat, as it runs such a risk of being destroyed by the water, but from the richness of such soils great crops of spring corn are raised.

In Cheshire the soil deposited at the extremity of salt marshes (commonly known there under the name of *sea sludge*) after it has been grassed over for a few years, is said to be the most productive and lasting of any sort of Manure used in the kingdom, containing all the strength of marl and the richness of black dung. It is much used at Weston, a village which divides the rivers Mersey and Weaver.†

XV. SWEEPINGS OF STREETS.

The value of this Manure is well known to farmers in the neighbourhood of great towns, who pay large sums for it yearly, besides the expence of gathering.

This Manure consists of a mixture of all those substances that are valuable in agriculture, and needs the assistance of fermentation less than any of them to render it fit for use, as it is made up principally of the offal of houses, dung of horses and cattle, ashes, and other active materials that render it immediately useful. From a knowledge of the nature of it, we think it should never be ploughed in deep, but always applied upon, or near the surface. In some instances where it has been used

* West Riding Report, p. 132. The Nile is not the only river that fertilizes the land it overflows.

† See Rev. Mr. Wright's MS. observations on the Cheshire Report.

in this way its effects have been wonderful,* from the slight cohesion of its parts it is excellently adapted to this sort of husbandry, and may likewise be put into the furrow with drill crops with great care.

XVI. SWEEPINGS OF ROADS.

In the near neighbourhood of great towns, a piece of industry is practised by the poorer sort of inhabitants, which is highly deserving of praise, this is collecting the horse dung that is dropped upon the road. Some travel along the highway with asses and collect it in baskets, others collect it in bags and carry it upon their backs; in both ways there are persons who make a subsistence by this alone.

In travelling along the road in summer, particularly that part of it which is called the summer road, we are struck with the great quantity of horse dung and other excremental matters that we see upon it, and which, if carefully swept together and collected, would be found of great value. If the trustees upon all the great roads, were to appoint people to sweep it during dry weather, and sell it to the neighbouring farmers, two material benefits would be derived from the practice; first a valuable Manure would be acquired, which is at present blown away by the winds, or serves only to annoy the passengers; and secondly, an additional sum would arise from the sale of it, for supporting the roads.

If either decayed whin-stone or limestone has been used for such roads, the sweepings of them will be a good Manure without any addition, but when this calcareous earth is joined to the excremental matters dropped by horses and cattle, it forms a compost of very high value. It is to be hoped, that this part of the subject will in future meet with more attention than it has hitherto done, as we are satisfied that many thousand acres may be manured in this way alone every year.

Perhaps no Manure can be spread more equally as a top-dressing than this, as its parts are completely separated, and require only a little attention in laying them on. Along many of the roads in England, immense heaps of this excellent Manure are to be seen, which if properly employed would enrich all the neighbouring fields.

XVII. EARTHS, AND EARTHEN OR MUD WALLS.

Earths of various sorts make a very good Manure, at least for one season. Virgin earth, it is well known, possesses fertilizing powers when used by itself, though perhaps it answers better, mixed in a dunghill. Fullers' earth is properly a fossil, and would be a valuable Manure could it be had in proper quantities.

* A farmer in the county of Haddington, who had fallowed a large field, but had not dung enough to manure the whole, sowed it with wheat. In the spring that part of the field, which had received no Manure, was very backward; and though there were plants enough in the ground, yet they were weak and unpromising. By that time he had collected a quantity of street dung from the town of Dunbar, which he applied as a top-dressing upon that part of the field. The effect was astonishing, the wheat immediately began to thrive, and when autumn came, that part which had been dressed in this way, was greatly superior to what had been dunged when the wheat was sown.

It is found by experience also, that walls of mud or earth, erected for the purpose of confining cattle in a fold, or by way of fence, acquire great fertility. Some assert that such walls are enriched by the nitrous particles they attract from the atmosphere; and others that they are ameliorated by the frosts (in consequence of the influence of which, the sides gradually moulder down), or from the vegetable fibres putrifying. Though perhaps not rich enough to be used by itself, there cannot be a better article for a compost.*

XVIII. MALT DUST, OR COMB.

This is reckoned one of the most efficacious of all Manures. It is the dust which separates from the malt in the act of drying. In the Report from Berkshire it is mentioned as being used in the shape of a top-dressing for a crop of barley,† and in Nottinghamshire, it is used both for clover and tillage land. When applied to turnip 6 quarters are used per acre, at the rate of 5s. per quarter. ‡

XIX. TANNERS' BARK.

Some writers on Agriculture have recommended tanners' bark as a Manure. In its raw state it is not likely to be of much service, but from some experiments made by the celebrated Mr. John Hunter, it certainly in process of time is converted into vegetable mould.§ When it becomes rotten and is spread pretty thick, it has been found of great use to grass ground.|| But the most likely mode of rendering it useful, is that of mixing it with lime, or perhaps with salt, by which it soon becomes converted into a valuable article. This plan may also be extended to other vegetable substances.¶

An intelligent Agriculturist recommends the following plan for using this article. After it is taken out of the tan-pit, and thoroughly washed, mix it with an equal quantity of fresh horse dung, including the litter, and cover it from rain, but let the whole be kept moist. When the heat is gone off, it should be mixed with a fresh quantity of horse dung and the heat renewed; when the heat is again gone off, the whole being made into a compost with chalk, will form as enriching Manure as can be procured.

* Here it may be proper to take notice of that miserable and destructive practice mentioned in some of the Reports from the northern part of the island, namely, the cutting of the surface of the ground, or *casting feal*, as it is there termed, which is so hurtful and pernicious a measure, that if nothing else will prevent it, the legislature ought to interpose its authority, and prohibit it by special statute.

† Berks. p. 25.

§ See Baird's Middlesex, p. 33.

¶ See Warwick Report, p. 48. Mr. Blakeley of Eschall, who first tried the experiment, mixed two waggon loads of tan, after it had been used by the tanners, with one waggon load of *unslacked lime*, which lay together for a week, and being used as a top-dressing for turnips, and for grass lands, was found to be a most excellent Manure.

‡ Notts. Report, p. 17.

|| Notts. Report, p. 30.

XX. SOOT.

Soot is used as a Manure in almost every part of the island, when it can be procured in sufficient quantities, and is applied in every different shape, and to all the different crops. Used in its simple state, it answers best upon light gravel, chalk, or limestone soils; if in a compost, the proper proportions are, two loads of soot, the same quantity of lime, and ten loads of earth. The soot and earth should be well incorporated, previous to the application of the lime, and allowed to remain in a heap for a week or ten days, then turned, and the lime added in regular stratum as it is turned over; in this state it may remain for a month or six weeks, and be again turned, taking care to break every part of it as small as possible by working it well with the spade, in a week or two more it will be ready for use.

The advantage of preparing soot in this way, is obvious; by mixing it first with the earth, the operation of the lime is prevented from being too severe, and when the dissolution of the soot does take place, it goes on gradually, and every part of it is absorbed, and retained by the earth with which it is mixed. The lime and volatile alkali will unite and form a caustic volatile salt, which will completely dissolve and separate the oily particles and render them missible with water; and the compound thus prepared will consist of rich nourishment for plants. This compost may be employed upon every sort of grain, especially for wheat or barley, and if rain fall soon after it is laid on, it will immediately begin to operate.

It seems to be a matter of no very great consequence, whether it is harrowed in with the seed, or used as a top-dressing upon the young crop without harrowing; for wheat it certainly should be reserved till the spring, as if it is used before winter, the greatest part of it will be washed away, before the plants have any occasion for it. The only risk that attends using it as a top-dressing without harrowing is, when dry weather immediately follows; when this happens, part of its valuable qualities will be lost, and the remainder, aided by the heat of the sun, may prove detrimental to the tender plants. By harrowing it in with the seed this evil will be avoided, as it will then be incorporated with the soil, which will both prevent the volatile parts from being exhaled, and the heat of the compost from doing any injury to the tender plants. When soot is sown by the hand, equal parts of soot, lime, and mould should be used, always taking care to mix the soot and earth first, and to apply the lime in as active a state as possible. For drill crops this compound admits of being used with great facility and precision.

XXI. PEAT MOSS.

Moss being a vegetable production, it is reasonable to suppose that it may be converted into a Manure; for this purpose many attempts have been made, but all of them have hitherto proved abortive, from the difficulty of subjecting it to the process of fermentation; by which means a substance containing nearly one half of its weight of the finest vegetable mould, together with a great proportion of oil and other principles, has not only remained useless, but has been considered as a nuisance.

A knowledge of the properties of animal and vegetable substances, informs us that they are more or less liable to putrefaction, according as they contain more or less of an acid or alkali in their composition. If the acid prevails, putrefaction takes place slowly, and with difficulty; but if the alkali prevails, putrefaction takes place very suddenly. The analysis of peat moss demonstrates that it contains an acid, in most cases nearly in the proportion of one-fourth of its weight. Its other constituent parts are *oil*, *alkaline salts*, and *vegetable earth*; these three last principles are known to be highly useful in vegetation, but when combined with an acid, their valuable qualities are not only locked up, but the whole mass is prevented from fermenting, by which process alone it can be rendered useful.

In considering this matter attentively, three questions arise, the first is:—can the acid in moss be corrected? the second; will it then be susceptible of fermentation? the third, and most important of the three; will it then be a good Manure? and can it be prepared at a reasonable expence? All of these questions we are able to answer in the affirmative:—the acid can be corrected at a trifling expence; when that is accomplished, moss being a vegetable substance will ferment in nearly the same circumstances as other vegetables do, and the produce will be equally valuable as a Manure. All this can be accomplished with small trouble, and at an expence trifling indeed when compared to the advantage resulting from it.

Every one acquainted with *chemical affinities*, knows that acids unite with alkaline salts and absorbent earths in preference to every other body; nay, so strong is their attraction for these, that when they are found joined to any other substance, they immediately quit that and unite with them; for instance, if a compound consisting of an acid and a metal, has an absorbent earth or an alkali presented to it, the acid separates itself from the metal and joins the alkali or absorbent earth. Alkaline salts and calcareous, or absorbent earths, are therefore the proper correctors of moss, and if applied with judgment, will answer that purpose very effectually. Having advanced this opinion, we proceed to describe the different ways of preparing moss for a Manure.

Method of preparing Moss for Manure.—1st. Lay moss that has been well dried,* to the thickness of three or four feet in the bottom of a dunghill, let the whole of the dung from the stables be laid above it, and suffered to ferment there. During the process, the natural moisture of the dung will sink down, and not only correct the acidity, but saturate it completely with the valuable properties of the dung. In this state it is ready for fermentation. This method of preparing moss, on account of the care with which it is performed, will generally be preferred, and perhaps there is no way in which it can be done with equal advantage, as the acidity is not only destroyed, and the moss filled like sponge with rich materials, but the dung will assist in subjecting it to fermentation. While it remains at the bottom of the heap, however, it will not ferment, the weight of the dung and the moisture it contains, being insuperable obstacles to the process.

In this state of things the dunghill should be turned over, and the dung and moss carefully mixed during the operation; if this is properly done, and the whole thrown

* Unless moss is properly dried and broke small, previous to its being mixed with other substances, every attempt to correct its acidity, or render it useful, will be abortive.

up lightly together, a gentle fermentation will soon come on, and of this ferment the moss will partake. After remaining in this state for a few weeks, it should again be turned, and a quantity of lime added, in the proportion of one load of lime to five loads of moss; the whole should be well broke and accurately mixed, the addition of the lime will accelerate the putrefaction of the moss, dissolve the oil contained in it, and give a due degree of activity to the whole.

2d. When it is preferred to lay the moss by itself, the whole urine of the cattle, moisture of the dunghill, soap ley, and offal of the house, should be poured upon it; and if this is carefully done, the effect will be nearly the same as when the moss is laid in the bottom of the dunghill; in this case the acidity will be completely destroyed, and if it is afterwards mixed with stable dung and lime, it will be equally valuable.

3d. The last way of rendering moss useful is by mixing it with pot-ash, kelp, lime, or chalk.

In the distant parts of the country, where moss abounds, and other Manures are obtained with difficulty, this is perhaps the most important way of any. When pot-ash is made use of, the quantity required to correct the acidity of moss, and render it susceptible of putrefaction is so small, that it can be easily obtained; 80 or 100 pounds weight, if properly used, will be quite enough for saturating a quantity of moss sufficient for an acre; indeed if the moss is completely dried much less will suffice.

The way of insuring the operation of the *pot-ash* upon the moss, is to dissolve it in boiling water; for that purpose the moss, after being dried, should be well broke, and a space, occupying a long square, covered with it to the depth of a foot, a fire should be kindled near it, with a large copper that will contain a considerable quantity of water, for every gallon of which half a pound of pot-ash should be put into the copper, and carefully stirred till the water boil; it should then be taken out and sprinkled with a watering-pan over the moss; the copper again filled, and the same quantity of pot-ash added, till the whole stratum of moss is properly saturated with the ley. When this is sufficiently done, a fresh stratum should be laid on, and treated in the same manner, and so on, increasing the heap to any size.

When a sufficient quantity of moss has been saturated in this manner, it should be left to itself for some weeks, and then turned; while the turning is going on a quantity of the freshest and most active lime should be added, taking care to work it well into the moss with the spade; after remaining in that state for some time longer, it should be again turned, and every part of it broke as small as possible. A gentle fermentation will succeed this last operation, and in a month or six weeks, the whole will be ready for use.

The principal points to be attended to in preparing all these composts, are—

1. To dry the moss sufficiently.
2. To break it as small as possible.
3. To incorporate the other substances well with it.
4. To allow it to rest a sufficient time after each turning.

Method of using Moss as a Manure.—Upon thin gravels or sharp active soils, such as chalk or limestone, the effects of moss prepared in any of these ways will be found highly beneficial, not only as a Manure, but also for thickening the soil. It will likewise be of service for thin clays; upon deep clays its effects will not be so sensibly felt, as these soils contain in themselves a sufficient quantity of the principles with which moss abounds; namely, oil and vegetable earth.

If the moss has been thoroughly broke it will be found an excellent top-dressing either for young crops, or for poor pastures; upon cold clays or light sandy soils, when used for wheat, it should be laid on in the spring upon the young plants. For barley, or other crops that are not to stand the winter, it may be harrowed in with the seed.

It is worthy of remark, that in the hilly parts of the country, where moss abounds, a great proportion of the arable land (particularly that part of it which inclines much to the south) is either a light gravel or a thin clay. It is upon these thin lands that the baneful effects of injudicious liming have been most sensibly felt; having little substance for the lime to act upon, they are soon exhausted of their oils, and are then in worse than a state of nature. To remedy this evil by the application of rich oily Manures, is impossible in those parts, as little Manure of that sort is made, and being remote from great towns, none can be bought.

In such situations the moss presents itself as a remedy, and if properly used, it will in general be found to answer the purpose; indeed, the application of moss to such grounds is only restoring to them a part of what they formerly possessed; for a very considerable proportion of the earthy parts of moss consists of the fine particles of the soil that have been washed down from the hills and elevated grounds by the rains, and deposited in the hollows.

Every farmer in the uplands should have three heaps of moss in a state of preparation, viz. one in the bottom of his dunghill, another upon which the urine of the stables, together with the soap ley, and offal of the house is poured, and a third to mix with pot-ash and lime, &c. &c.; by these methods, and at a very inconsiderable expence, five or six times the quantity of Manure that is usually made might be procured, the produce of which in grain, and the increased quantity that would every year arise from the additional quantity of straw, would bring the cultivation of these parts to as high a degree of perfection as they are susceptible of.

Some farmers may be inclined to think that such minute attention to matters of this sort is unnecessary, and that the advantage arising therefrom will not compensate for the labour that is bestowed upon them; but we hope the intelligent part of that class of men will readily see and be convinced of the utility of it. In the single article of the offal of a farm house, whoever considers the immense quantity of *urine, soap ley, dirty water*, and other excremental matters, that are daily thrown away carelessly about every farm house in the kingdom; all of them impregnated either with oil or alkaline salts, will at once perceive the value of them when collected for a whole year. To do this effectually, no way seems so proper as pouring them upon moss, earth, or such substances as will absorb and retain them.

This account of the properties of moss is not founded in conjecture or idle speculation, but proceeds upon a correct knowledge of its constituent parts, obtained by a careful analysis, and from repeated trials of its effects, both by mixing it with dung, urine, pot-ash, and lime, all of which have been completely successful. It is also fully confirmed, by the information transmitted to the Board from Bedfordshire, which will be stated afterwards, when the subject of peat ashes comes to be considered.

XXII. SHEEP FOLDING.

The practice of folding sheep as a Manure, or rather as a top-dressing, is common in many parts of England, and is productive of considerable advantage. They are folded both upon arable and pasture lands; upon the arable lands it is sometimes done before the last furrow, at other times after the grain is sown. This last is found from experience to be the best method of folding, as the urine and dung of the animal remain upon the surface, and soak down gradually; whereas, when the field is folded before the last ploughing, a considerable part of the Manure is turned down and lost. The spring and summer seems to be the time when this practice is most beneficial; at that time the food of the animal is rich and juicy, but during the winter, unless the sheep are fed upon turnips or hay, their dung is of small value.

It is obvious that folding, after the grain is sown, can never be practised but upon dry soils, and during dry weather.

This way of manuring seems peculiarly adapted to farms where there is a considerable extent of hill, or common pasture, or grass lands, that never come under the plough. In these cases, by bringing the sheep in the evening to the fold, a considerable quantity of Manure will be saved that would otherwise be lost. If the pasture upon which the sheep feed through the day is good, they may be folded, without any detriment to the animal (if not intended to be fattened), for a great part of the year; but where the pasture is scanty this cannot be done, as they will not be able to pick up a sufficiency of food through the day to enable them to bear the fatigue of travelling to and from the fold, and fasting all night.

When they are fed in the fold the case is different; but feeding in the fold will not admit of being practised as a top-dressing after the seed is put in; it seems best calculated as a preparation for wheat or barley upon fallows; in either of these cases they may be fed in the fold with propriety, as the offal of their food will be ploughed in with the last furrow, and the land properly opened for the reception of the crop; even this requires to be done upon dry light soils; upon these a gentle shower will not be felt, nor will there be any danger of the land being battered with the feet of the sheep; whereas upon clays or deep loams, the soil will sustain more injury by the treading of the sheep in wet weather, than all the benefit communicated by their Manure.

Defects of the common way of Folding Sheep.—The custom of putting a great number of sheep into a small fold is very common, allowing them little more than a square yard each, and confining together sheep of every description, young and old, strong and weak; both practices are bad. In the first, if sheep are fed in the fold, the space allotted to each will be so small, that they will be crowded, and a considerable quantity of their food trodden down and destroyed; the breaths of so many confined together, within such narrow limits, will keep them too warm, and when they are disposed to lay themselves down, there will not be sufficient room for that purpose.

To avoid these inconveniences, a space containing room enough to afford three or four square yards to every sheep would answer the purpose much better, and though this large area would not receive so much advantage from one night's folding, yet by allowing the sheep to remain upon it for two or three nights, it would be sufficiently

manured, with this additional benefit, that no part of the fodder would be destroyed by trampling upon, and the animals would have a dry bed and plenty of room.

The second defect in the present way of folding is equally bad, if not worse, that is the custom of folding sheep of every description together. When a great number, either of sheep or other animals, are put together to feed, unless they have an over quantity of food given them (which every good farmer would wish to avoid) there will always be a struggle who shall get most of it; in a contest of that kind it is evident that the strongest will succeed, and by depriving the weaker ones of their food, their weakness will be increased, and a risk incurred of losing them altogether; whereas by picking the flock, and folding the strong and weak sheep separately, both would be benefited thereby; the strong ones would still have a sufficiency of food, and the weaker sort would be allowed to feed, and lie at their ease; in this situation they would gain strength, and improve in value, in the former they would be daily growing worse.

In short, wherever folding is practised, it should be a principal object with the farmer to assort his flock, and as near as possible to class those of the same age and strength together, and whatever preference is given, either in the quantity or quality of the food, should fall to the share of the young and weak.

The practice, as far as we are able to judge from the information before us, is entitled to the notice of farmers in every part of the kingdom; but in that as in every other branch of agriculture, much must be left to the judgment and attention of the farmer, it being impossible to lay down rules that will apply to all the different circumstances of soil, situation, &c. It certainly is best adapted for dry lands, and farms containing much pasture that is never ploughed; upon these, as we have already observed, much Manure may be collected that would otherwise be lost; but upon farms that are entirely arable, and where grass makes a part of the rotation, to bring the flock from the pasture and fold them upon another field, is depriving the grass field of a great part of the benefit that might be expected from its being in pasture, and is enriching one part of the farm at the expence of another. The only instance in which it is warrantable upon an arable farm, is in cases where turnips are raised either upon clay or heavy loam; in either of these cases they may be eaten with advantage upon grass or stubble fields, as no farmer of common sense would think of eating them where they grow; but as we have already observed, the propriety of this must be left to the judgment of the farmer; much advantage may certainly be derived from it in some situations, and great loss sustained in others.

XXIII. PLOUGHING IN OF GREEN CROPS.

As all vegetables afford, in different proportions, Manure of considerable value, the practice of ploughing in green plants for the purpose of enriching the soil, is extremely ancient, and in particular is recommended by all the Roman writers on husbandry.

Pease, beans, buck-wheat, turnips, and other moist and juicy plants, if ploughed in when in full bloom, at which time they abound most in sap, yield a valuable Ma-

nure; this mode of fertilizing the soil is less practised than it deserves.* In Warwickshire, vetches and buck-wheat are sometimes sown and ploughed in for Manure. It appears from the Report of the county of Nottingham, that clover ploughed in as a preparation for wheat has been found to answer. When it is considered at what small expence of prime cost, carriage, and other charges, this species of Manure is obtained, it is to be wondered at that it has not been more generally adopted in this island. It is of all others the most economical, and might, no doubt, be used on many occasions, in place of a complete summer fallow, as a preparation for a crop of wheat; in which case the price of the seeds, which is almost the only expence, would be amply repaid by the saving that would take place in the article of labour.

The price of ploughing down green crops might be much improved, by laying on a certain quantity of lime, chalk, or marl, according to the nature of the soil, which would tend greatly to hasten the fermentation of the green crop ploughed in, and bring the land the sooner into a proper state to afford nourishment to the succeeding crop of wheat.

XXIV. DECAYED VEGETABLE SUBSTANCES.

It is certain that decayed vegetables are of use as a Manure. Some probably are of little more use than common earth or mould; but others have saline, oily, and other articles in them of considerable value. Mortimer reckons the rotten wood of hedges and coppices, to be a great improver of the soil where it drops, and instances the earth where faggot piles have been used to stand.† All such substances may be added to strong heating dunghills.

Leaves of trees have been found to answer as a Manure for potatoes.‡ They ought to be carefully gathered at the fall, and formed into a heating dunghill.

XXV. WATERING.

The use of water as a Manure, is an object of such magnitude and importance, as to require a separate Chapter of this Report. It is unnecessary, therefore, to enter farther into the subject at present, than to refer to Chapter 27, in which it will be fully treated of.

* On the other hand it is asserted, that this is a wasteful mode, that the crop should be cut as near the ground as possible, just as it is coming into flower, slightly dried, and made into a dunghill; but if tanners' bark, straw, old thatch, or any other vegetable can be procured, which is of difficult fermentation, it is very useful to mix with it, as soon as cut down. If it be forward in the year, the crop may be allowed to spring again, cut a second time, and treated in the same manner. The dung thus formed may be partly spread at the time of sowing the seed, and partly used as a top-dressing.

† Mortimer's Husbandry, p. 380.

‡ Perth Report, p. 40.

XXVI. PUTRID WATER FROM THE STEEPING OF FLAX, HEMP, &c.

It is stated in a very valuable Report laid before the Board,* that the land on which flax was spread for drying, after being steeped in water, being greatly improved thereby (coarse and sour pasture being changed into the best sort of grasses, and into sweet herbage), Mr. Billingsley was thence induced to apply it to pasture land, by means of carts, similar to those used near London for watering the roads. The effect was astonishing; and advanced the land in value, from 10s. to 50s. per acre. This liquid, he supposes, is much superior to animal urine; and it is earnestly recommended to the attention of those who cultivate flax or hemp.

In Lincolnshire, where this branch of husbandry has been much attended to, they find the sediment of the pits, in which flax or hemp have been steeped, a very valuable Manure; and, considering these circumstances, it would appear that an idea commonly circulated, that flax and hemp ought not to be cultivated in this country, because they are exhausting crops *and return nothing to the soil*, is not perfectly well founded. It has not yet been ascertained, to what extent Manure from an acre of flax can be obtained, but it is probably considerable.

This circumstance, above alluded to, naturally leads to the following observations.

1. It is well known, that flax will grow in almost any part of the country, however elevated. In consequence of the rapidity with which it grows, and the short time necessary for its remaining in the ground, it is hardly ever injured by frost. If, therefore, any quantity of flax were raised in the higher parts of our mountainous districts, and is kept in ponds or reservoirs of water there, the water might thus be converted into a useful Manure, and irrigating the land below, might convert it into excellent pasture.

2. The second observation is, that improving water as a Manure has been much less attended to than probably it deserves. To make it fit for that purpose, nothing more is necessary than to render it putrid. From its being in a liquid state, it seems to be better adapted for being brought into a putrescent state than earth, and other substances of a more compact and closer nature. If any chemist could discover a mode of quickly rendering a considerable quantity of water putrid, at a small expence, he will probably do more for the improvement of Agriculture, than could possibly be effected by almost any other discovery.

The most likely mode is to collect it into pools, render it stagnant, and put green vegetable substances in it. This will produce putridity in the space of a few days.†

* Somerset Report, p. 147.

† Putrid water, it would appear, must possess the singular property of extirpating that part of the gramineous tribe which are adverse to the purposes of the grazier and farmer, or of changing (as here stated) the coarse and sour grasses, into that sweet herbage agreeable to his wishes. This quality of water will certainly be worth attending to. In Devonshire water is meliorated by lime in ponds, there known under the name of *Presidents*; which are ponds enriched by the drain of an adjoining *lnday*, or yard, with the addition of a bag of lime at different times.

XXVII. BURNT LIMESTONE.

The effect of lime and other calcareous substances upon vegetation is, perhaps, one of the most valuable and extraordinary discoveries that Agriculture has to boast of. It is hardly possible for the wildest imagination to conceive a proposition apparently more absurd, than that of taking a piece of the hardest stone or marble, burning it till completely calcined, throwing cold water upon it, with a view of reducing it to a white powder, and expecting from the effect of that powder, when mixed with the soil, a luxuriant crop of grain, of grass, or other vegetable production; and yet, when properly applied, the effect is unquestionable.

The beneficial effects of lime in particular, either when applied alone, or used in conjunction with other substances, entitle it to the highest notice. Many different and even opposite opinions have been entertained upon the manner in which it operates, few of which are completely satisfactory. It is known, from experience, to produce bulky luxuriant crops, upon lands formerly of little value; but from the barrenness that frequently succeeds these bulky crops, lime has been thought dangerous, by stimulating the soil overmuch. Indeed, if great care is not taken, after a few exhausting crops, it will be in a worse situation than it was before the application of the lime.

The principal points to be attended to in the lime husbandry, are the following:

- 1st. To ascertain the quantity proper for each soil.
- 2d. The mode of applying it so as to insure the utmost benefit from its use.
- 3d. The way of preparing it previously to its being laid upon the soil.
- 4th. The proper rotation of crops to be afterwards followed, so as to preserve the land in a state of fertility.

With regard to the first of these points, namely, the quantity necessary for the different soils, we cannot, in a work like the present, presume to fix it, as that can only be determined by experiments carefully made; but though we decline mentioning the precise quantity proper to be used in all the different situations, we imagine that a general rule may be laid down, which, if carefully kept in view by practical farmers, will, in process of time, lead to the establishment of a standard.

Upon this point some information will probably be obtained by perusing the Chapter upon Soils, where some account must necessarily be given of the constituent parts of each. In general, however, it may be observed, that the greatest quantity of lime should be used upon the deepest and richest soils, and the least upon those that are thin and light; lessening the quantity gradually from the strongest clay to the lightest gravel. Intelligent farmers will at once observe the justice of this remark. Upon strong clays and deep loam there is a substantial body for the lime to operate upon, containing abundance of rich substances, and consequently a considerable quantity will be required to pervade and give due activity to the whole; but in proportion as the soil grows lighter, the quantity employed must be less, and the after-management, with regard to crops, extremely cautious. In short, the most trifling difference in the qualities and consistency of the soil, ought to be a matter of serious consideration with the husbandman, gradually lessening or increasing the dose, as circumstances may

require. In liming a single field his attention will often be found necessary, particularly if the surface is unequal. The soil of the higher parts will for the most part be found light and free; while that of the lower is deep and compact. It is obvious, that if a field of this description is limed, and the same quantity laid over the whole, if the quantity is small, the higher parts only will be benefited, while the strong deep land will scarce receive any advantage. On the contrary, if the quantity is great, the higher land will be over limed, while that below will hardly have enough. To some farmers these may be thought nice, perhaps trifling distinctions; but we trust that, by every judicious man, they will be considered as important. It is seldom that we have seen sufficient attention paid to this circumstance: on the contrary, be the difference of soil what it will, and in large fields it is often very great, we for the most part see the same labour bestowed, and the same quantity of lime and other Manures laid over the whole. The consequences attending such management do not require to be pointed out.

To do justice to this part of the subject, notice should be taken of the necessity of laying out land in such a way as to have the whole field, as nearly as possible, of the same quality. Where this is attended to, much difficulty and loss will be avoided, both in manuring and fixing the rotation of crops; but this belongs more properly to the Chapter upon Inclosing, and will be treated of at some length under that article.

We cannot take leave of this part of the subject, without earnestly recommending it to every farmer to make himself thoroughly acquainted with the nature of his land, before he ventures upon the use of lime. On some soils, indeed, he will find it totally inadmissible, particularly where the bottom is chalk, limestone, or marl; in all of which it will be pernicious, especially if the soil is thin. In such situations a judicious farmer, in place of laying out his money upon lime, which will not only be lost, but do mischief, will employ it in purchasing enriching Manures, which will afford him an ample return.

Having dwelt at some length upon the quantity of lime that ought to be employed upon the different soils, and laid down rules for ascertaining it, we come now to speak of the manner of applying it. In perusing the Reports of the different counties throughout the kingdom, we find it applied in a variety of forms; and in the districts where particular practices obtain, we in general find the people ready to give reasons in support of this system. To detail the whole of these practices would be incompatible with the bounds prescribed to us in this paper; we shall therefore notice only the modes that prevail most, and are practised by the best farmers, who in general use it in one or all of the following ways:

1. Upon fallows, for wheat or barley.
2. Upon turnip land.
3. Upon clover ley for oats.
4. As top-dressing upon wheat, &c.

1. *Lime upon Fallows.*—When lime is applied upon fallows, it is found to produce the best effects when laid on early in the season, and thoroughly incorporated with the soil. For that purpose it should always get at least two or three furrows, and a complete harrowing with each. By this treatment it will be thoroughly incor-

porated with the soil, and will operate equally upon every part of it; so that the farmer will reap the benefit of it the first year; whereas, by laying it on only before the last furrow, without harrowing, a great proportion of it will be buried, much of the soil will never come in contact with it, and very little advantage will be derived from it the first year; and when the land is ploughed for the succeeding crop, in place of being able to bring up the whole of the lime, as many farmers vainly imagine they are able to do, a considerable proportion of it will be found to be lost by the rain filtering through the soil, and carrying the lime down along with it.

To give some idea of the loss sustained in this way, we have only to observe what happens where a heap of lime is laid down: if a quantity of rain fall sufficient to saturate the whole, the moisture that runs off will be perfectly white. This colour is given by the finest and lightest particles of the lime being suspended in the water. The same effect certainly takes place upon every limed field; and however judiciously the lime may be employed, it will happen in a certain degree; but when it is ploughed in without being previously harrowed, it will be still worse, as a considerable quantity will be turned to the bottom at once: where it will either be carried into the bowels of the earth, if the soil is open, or concrete into a cake, if the bottom is compact.

It is customary in many places first to dress their fallows with lime, and plough it in; afterwards to manure with dung, and plough it in also. For this practice no sufficient reason is assigned: indeed it would be difficult to give one; for if the soil stands in need of lime, the dung is unnecessary: or if the field has been formerly limed, and the operation of the lime is intended to be principally exerted upon the dung, the design is frustrated by its being previously mixed with the earth. In all cases therefore, where lime and dung are employed upon the same field, they ought either to be used by way of a compost, or laid on at the same time. In either of these cases the operation of the lime upon the dung will be in a great measure insured. In the former it will be completely so; and perhaps experience will prove this to be one of the best ways of using it. In the latter, though the lime will certainly have a greater effect upon the dung when they are laid on at the same time and ploughed down together, yet it is utterly impossible, even in this way, to bring them so completely into contact with each other, as to produce the utmost benefit that might be expected from their union. Few arguments will be necessary to prove, that this is only to be done by incorporating them thoroughly previous to their being laid upon the field.

It has sometimes been given as a reason for not mixing them in the manner we have mentioned, that it could not conveniently be done: that lime being an article to be had in the market, the farmer can procure and lay it on at any time; but dung being made by slow degrees, by deferring the laying of it on for a month or two, an additional quantity would be obtained, and by that means more land manured. This undoubtedly is a plausible, but by no means a satisfactory reason; for admitting that more dung is made in the stables during that short time, it does not follow that the quantity of Manure will be increased in proportion. We have already taken notice of the necessity of fermentation to common stable dung or litter, and are perfectly satisfied that any thing produced in the stables will be very unfit for use in the

ordinary way of farm-yard management, in so short a space as a month or six weeks. It is however certain, that considerable quantities are every year led out fresh from the stables, and employed in this disgraceful way.

Instead of hurrying it to the field in this raw unfermented state, if farmers would be at the trouble of making three or four dunghills in place of one, the dung would not only be sooner fermented, but they could with little labour, and without any loss, fix upon the dunghill that was best fermented, and use it either by itself, or in conjunction with lime, and leave what was last made till it was fit for use. By this management the whole manure upon a farm would be completely fermented, and no part of it lost.

The former practice is however too common; for we very often see upon a fallow field that has been limed, the occupier straining to cover as much of it as possible with manure; and in the attempt, laying it on in a situation little better than dry straw; so much so indeed, that a stout ploughman and four horses are often unable to take a furrow deep enough to cover it.

When dung and lime are laid upon the same field, if they are not used in the form of a compost, it might be attended with considerable advantage to lay the lime on so early as to give the land, at least, three ploughings before it is sown; then to put in the whear, and top-dress with the dung early in the spring; or if barley is sown, to top-dress with the dung, and harrow both in together. In a few instances where this practice has been followed, the success has been very great, particularly upon wheat; as the dung is applied at the time when the plants suffer most, and are in greatest danger of being killed. When this method of manuring is adopted, the wheat will, in general, put on a deep verdure in about a week or ten days after the dressing is applied; and by the warmth, protection, and nourishment it affords to the plants, they will not only be rendered strong and healthy, but their numbers will be considerably increased by its effects. This is not idle speculation; repeated trials have been made; and the most incredulous may be convinced by a single experiment.

It will no doubt be objected by many, that the strength of the dung, thus employed, will be lost, from its being dried and exhaled by the sun and atmosphere; that it will be a difficult matter to spread it upon the young crop; and that many of the plants will either be killed, or materially injured, by the carts and horses driving over them.

To this we answer, That in the spring the influence of the sun is small, consequently the evaporation cannot be considerable (during N. E. winds excepted); and what is even then evaporated, consists chiefly of the aqueous parts; that as no body, unless it is heated to a certain degree, will part with any of its volatile salts, so none of the salts of the dung can be lost in that way; and that long before the warm weather sets in, the ground will be completely covered with the crop, and the juices of the manure left to soak down slowly and nourish the plants.

The second objection, with regard to spreading the dung equally, is no better founded; for if the dung is properly fermented (and we have already said that it ought never to be used but when it is so) it will be rendered so short, that it may be spread with ease; but it is to be observed, that when dung is used as a dressing for young crops, it should be spread immediately from the cart, in place of laying

it down in heaps. As to any destruction of the plants, that can only happen from the grossest mismanagement; for if proper attention is paid to laying on the dung when the land is sufficiently dry, they will rather be benefited than hurt by being trod upon; as it is well known that wheat-lands, of every description, if they have been well wrought before the winter, and much hard black frost succeeds, are generally as loose as a mole-hill in the spring, especially such as have been well limed or dunged. This is the greatest evil to which early wheat is exposed; for the soil, by being rendered loose and porous, exposes the roots of the plant to the cold piercing spring wind; which too often proves fatal to it. Dressing upon the top, at that season, with dung or composts, promises to be a remedy for the evil, which, if properly conducted, will probably be found superior to every other, for affording warmth and nourishment to the plants; nor will the benefit be less sensibly felt if barley is sown upon the fallow, and the dung harrowed in along with it, particularly if the soil is light. The operation of laying on and spreading the dung upon the last furrow will give the land a degree of firmness and cohesion that will enable it to resist the drought, if dry weather should follow the seed-time; and the moment a shower falls, the juice of the dung will sink down, and afford ready nourishment for the crop.

It must however be observed, that this mode of dressing upon the top of young crops can never be put in practice but when the land is tolerably dry, and the dung well fermented; where this is the case the returns will be abundant, not only for the present but succeeding crops. Indeed we have long entertained an opinion, in which we believe many experienced farmers will agree, that a very great proportion of all the dung that is laid upon wheat lands is lost by the winter's rain; for if the dung has been properly prepared, every winter shower that falls will carry away some of the salts from the soil; and, when the spring arrives, a great part of the food of the plants will be found to have perished during the winter; whereas were the application of the dung deferred till the spring, when the growth of the plant commences, we can readily understand what becomes of it; the wants of the crop would take up all the rich parts after every shower, and their progressive increase would constantly demand a new supply; so that every part of the nourishment would be properly applied. On the contrary, as we have already observed, when the manure is laid on in autumn, it is exposed to the continual washings of the winter's rain, and at a time too when it can be of very little service to the plants; for wheat, like every other seed that is sown in autumn, if it vegetates and establishes itself in the earth before winter, does all that can be expected. During the winter it makes no progress, consequently needs no assistance from the soil; and, as we shall immediately observe, its chance of remaining in the ground is greater where no manure is used than where it has: the effects of lime and all manures is to open the soil during winter, particularly where much stable-dung has been used; and as the plants make no progress during that time, so every thing that opens the soil and exposes the roots to the cold must be hurtful; and if to the injury of opening the soil, we add the loss that is sustained by the salts of the manure being washed away and lost by the rains, we shall readily be convinced that the application of dung in autumn upon fallows with lime, is very often throwing it away. Indeed, in cases where dung is used by itself upon fallows, the

application of this maxim is equally proper, as the best salts of good stable-dung are nearly as perishable when applied by themselves, as in conjunction with lime. Top-dressing in the spring will therefore be proper in this case also, though it will certainly have a greater effect when lime has been ploughed into the fallow: in that case, while the lime is stimulating and acting upon the principals of the soil, the juices of the dung will be gradually sinking down, and at once correct the hot caustic effects of the lime, and afford nourishment for the crop.

We have dwelt longer upon this point than was intended; but we trust the observations that have been made will not be thought inapplicable to the subject. We come next to speak of the practice of liming for turnips.

4. *Lime for Turnips.*—In this branch of husbandry the value of lime stands conspicuous; for by the assistance of it whole districts, formerly useless, have been made to produce not only good crops of turnips, but also valuable crops of corn and broad clover. Its greatest value, however, seems to be met with upon light soils for these crops: and this is now so well known, that in those parts of the country where lime is the principal manure, they seldom attempt to sow either turnips, clover, pease, or beans, except upon lands that have been previously limed; as they know to a certainty that these crops will not succeed where no lime has been laid. Examples of this sort are often met with in the uplands; where if any of the broad-leaved crops are sown upon a field where a part has been limed, and a part not, even though the whole field has been well dunged, the parts where the lime has been laid will produce a valuable return, while that which has got no lime will hardly repay the expence of seed and labour.

Method of using Lime for Turnips.—In different parts of the kingdom different methods of using lime upon turnip-lands prevail indeed in the same county; scarce any two farmers conduct their operations in the same manner. With some it is the custom to use it only before the last ploughing, and to plough it in without harrowing; they also lay it down in heaps, not from the kiln, without being slacked. The reason given for this is, that the lime is supposed to have a much greater power upon the principals contained in the earth, when it is in the act of slacking, than it has afterwards; and certainly, if unslacked lime could be broke sufficiently small, and intimately mixed with the soil, it would be found most active in that state; for from the time a lime-shell is slacked, its activity begins to diminish, and it takes a retrograde course towards the state of lime-stone: the operation of burning lime being nothing more than depriving it of the fixed air and moisture which it contains; and the more completely these two component parts of it are expelled, the better will be the quality of the lime; but so great is the attraction of calcareous earths for fixed air and moisture, that the moment they are taken out of the fire they begin to imbibe them, and continue to do so till they are in some degree saturated. But though we are clearly of opinion, that unslacked lime will, if broke small enough, have a greater effect upon the soil than that which is slacked, we condemn the common way of laying it down in heaps before slacking, for the following reasons:

1st. If it is wanted for immediate use, when the weather is dry, it may be a considerable time before a quantity of rain falls sufficient to slack and pulverize it properly: in this case the ploughing of the field must necessarily be delayed.

2dly. If lime thus laid down in heaps receive only a certain proportion of moisture,

it will be very imperfectly slacked; consequently will not be sufficiently reduced either for spreading equally or mixing properly with the earth.

Lastly. If the quantity of moisture is too great, the lime, after being slacked, runs into cakes, which cannot afterwards be broken so small as to render it useful. Upon the whole, this seems to be a most objectionable way of using lime; for by delaying the application of it till the last furrow, and ploughing it in without a previous harrowing, it can scarcely be said to be mixed with the soil at all. The consequences of this practice are obvious. When the seeds are put into the ground, in place of having a bed composed of earth, and a due mixture of lime, a great part of them will be laid entirely amongst the lime itself, and the remainder, by falling amongst earth, where there is no mixture of lime, will receive no benefit from it. Owing to this management a great proportion of the seeds never vegetate, unless the season is uncommonly moist; even then, though the plants grow, yet from the lime being so unequally mixed, they will always sicken in dry warm weather, many of them will die during the summer, and a part of the remainder will be stunted and of little value.

In short, the same observations that were made with regard to the use of lime upon fallows for wheat, apply with equal propriety to turnips. The sooner it is laid upon the field, and the more ploughings and harrowings it receives before the seed is sown, the better will it be incorporated with the soil, and the more certain and valuable will be its effects: and, what is of singular advantage in the case of turnips, by mixing the lime thoroughly with the soil, its hot caustic qualities will be blunted, and the safety of the seed thereby insured; accordingly, there are fewer instances of turnip crops being hurt by dry weather, where the lime has been well incorporated with the soil, by repeated ploughings and harrowings, than where it has received only one furrow; for it is notorious, that lime in a naked state dissolves all oils; and when it comes in contact with oily seeds during dry weather, they are rendered incapable of vegetation afterwards.

3. *Lime upon Clover Ley for Oats.*—The practice of laying lime upon clover ley for oats is very common on both sides of the Tweed, and is perhaps the worst way in which it can be used. It is generally laid on in the autumn, and ploughed down in the spring; and the returns in such cases are very inadequate to the expence. Nor can it be otherwise; for if we attend a single instant to the process, we will be convinced that the lime has no chance of being useful. The oats are generally sown upon clover ley with one furrow, and if the grass crop has been good, the furrow will be turned over entire; and if lime has been laid upon the surface, it will either be laid flat down to the bottom of the furrow at once, or, if the furrow is set up on edge, it will be left exposed upon the face of it. In either of these cases it is worth enquiring what has become of the lime. The result will satisfy us, that in both instances it is in a great measure lost; for if the furrow is turned flat down, which is often the case, the lime will be so low that it can be of no use to the oat crop; indeed it is impossible that it can, as there is the whole thickness of the turf between it and the roots of the plant; and this turf is often so compact and tenacious, that it cannot be reduced even by the operation of the harrows. In this situation, if the bottom is open, a great proportion of the lime will be carried down before the next season, and thus for ever lost both to the farmer and the proprietor.

If it is left exposed upon the brow or face of the furrow, the consequence is nearly the same as when it is turned down at once; for every shower that falls will wash it down between the furrows. We have observed numberless instances of this, where the lime has been as completely washed to the bottom during a heavy shower, as if it had been laid there on purpose.

Farmers complain that lime, when applied in this manner, does not afford a profitable return; or, in their own language, does not pay well. From what we have said, it is hardly to be expected that it can, as the major part of it is turned down to the bottom, where it can have no chance of being incorporated with the soil; consequently can be of no service to the present, and in all probability of very little to succeeding crops.

Upon the whole we conclude, that there is no way in which lime is employed where so much of it is lost, or where the returns are so inadequate to the expence: the practice has scarce a single reason to support it, except the convenience that attends being able to lead out and spread the lime upon ley at any time. Indeed many farmers assign this as their only reason for continuing a practice which they know, from experience, to be unprofitable.

4. *Lime as a Top-dressing upon young Crops.*—It is customary in some parts of England to top-dress with lime in the spring, both upon grass and young crops of wheat and other grain. From every observation that we have been able to make, this practice is highly objectionable in most cases; and even where it is ventured upon, the management should be extremely cautious. Upon young crops of grain of every description we pronounce it dangerous, unless the lime is made into a compost with other substances, such as dung and earth; in this form the use of it will not only be safe but profitable; and we can readily understand how it should be so: its hot stimulating qualities will be exerted upon the substances with which it is mixed, previous to its being used; and in place of burning and destroying the tender plants, which lime in its naked state always does, it will afford them a valuable nourishment.

Lime as a Top-dressing for Meadows.—With regard to the application of lime as a top-dressing for broad clover, &c. we entertain nearly the same opinion of its effects as for young crops of grain (*Vide Experiments*). If it is more useful upon one sort of grass-grounds than another, it will certainly be upon coarse meadows. Upon lands of this description, abounding with rushes and other useless plants, it is highly proper; but in these situations it is the instrument of death; for it is well known that the coarse herbage in meadows is entirely destroyed by a complete liming. Whether this effect is produced by the lime destroying the plant, or by its altering the nature of the soil so much as to render it incapable of nourishing such herbage in future, may be difficult to determine. Perhaps the last will be found the true cause.

Upon such grounds therefore the effects of lime, as a top-dressing, will be highly beneficial; and this benefit will be still farther increased, if the meadow is capable of being ploughed; for though lime may be inimical to rushes and other coarse plants, even in a growing state, it will be still more so when their connexion with the soil is destroyed. To summer-plough these meadows therefore seems to be the proper plan, and after they have remained for some time in that state, to

cross-plough and expose them to the winter's frost, then to lay on the lime, and harrow it till the soil is completely reduced, and the lime incorporated therewith. By this management two important points will be gained: by turning down the turf and exposing the roots to the sun and air, the coarse herbage will be in a great measure rotted, and the frequent ploughings and harrowings afterwards given will incorporate the lime and insure its operation, not only upon the soil itself, but upon the undecayed vegetable substances that remain in it. Thus much of lime upon meadows that can be ploughed. Upon such, however, as cannot be submitted to the plough, the use of lime seems to be an improvement that belongs more properly to the landlord than the tenant; for though lime will ameliorate such meadows considerably, yet the increase in point of value will not be sufficient to afford the farmer a competent return for his labour and outlay of money; and unless his lease is very long, he will have the mortification of seeing his stock sunk for the benefit of another. For it should always be remembered, that when a tenant is about to lay out money upon improvements, if he is a man of sense, he will do it in such a way as to afford a reasonable prospect of his being repaid, not only principal and interest in a few years, but also a suitable compensation for his labour and risk.

With a proprietor the case is different; for if his property is benefited so much as to raise its yearly value in proportion to the interest of the sum expended, he can never be a loser; and if the advantage is greater, which in all well conducted improvements it certainly will be, the overplus will be a reward for his risk and enterprize, and will operate as a stimulus to farther exertions.

The above comprehends nearly the whole of the lime-husbandry of Great Britain, upon which we have delivered our sentiments with freedom and impartiality, and have censured the errors of the present system without hesitation; but, as was formerly observed, our censure has not arisen either from a desire of novelty or a spirit of detraction, but from conviction built upon a perfect knowledge of the nature of calcareous earths, and their operation upon the principles they meet with in the soil.

We will now attempt to give some directions with respect to the manner of treating lime, previously to its being laid upon the soil; the rotation of crops to be afterwards followed, so as to insure the utmost benefit from its use, without exhausting the land by over exertion, and conclude the article with a few observations.

Method of treating Lime, previously to its being used as a Manure.—In all cases where lime is employed by itself as manure, its operation must be upon the principles contained in the soil. Taking this for granted, we can at once see the necessity and utility of applying it equally to every part of the earth. This can only be done by first dividing the lime into the most minute particles, and breaking the parts of the soil so small, as to make them incorporate readily. To accomplish this purpose, much care and attention will be requisite, both in preparing the lime and labouring the field. If the lime receive a sufficient quantity of moisture, and no more, it will be reduced to a fine powder, capable of being spread equally over the soil: in that state, if properly treated, it will incorporate well, and answer every useful purpose: but if more moisture is given than is sufficient for slacking it properly, the lime will run into lumps or cakes, as was formerly observed. In this

state it will neither spread equally, nor will its effects be good, even though double the usual quantity be laid on. We have already taken notice of the instances in which this caking most readily happens; that is, where the lime is laid down in small heaps, hot from the kiln. Where it is applied in this way, there is scarce a possibility of regulating the moisture in such a manner as either to give it the necessary quantity, or prevent it from receiving too much.

The only way in which this difficulty can be obviated is, by laying it down near some small rivulet, and throwing water upon it. The trouble of doing this is small, and the advantage arising from it great; for by a little attention, it is not only properly slacked, but is rendered, in an hour's time, fit for laying upon the field; and in every case where it can be done, it ought to be laid on without loss of time, and well harrowed in; for, independent of its powers being lessened, by exposure to the air, the chance of its running into lumps is not at an end even after it is spread; for if the quantity laid on is considerable, and the weather moist, it will run into cakes upon the surface as readily as when it remains in heaps. This every good farmer is aware of; and accordingly it is a maxim with them to harrow and plough it in as soon as possible.

It sometimes happens, however, that lime is brought home as a matter of convenience, when the other labour upon the farm is slack, consequently at a time when it cannot be used: even in this case it is a matter of importance to have it properly and immediately slacked; some care, however, will be necessary, both to preserve it from being weakened by the action of the air, and from running into lumps. Both these purposes may be accomplished by proper attention; for if the lime, after being slacked, is thrown up regularly in the form of a ridge, with a sufficient slope to carry off the water, and covered to the depth of three or four inches with earth, and the top of the ridge secured with thatch, it may be kept in this way for three or four months, and taken out of the heap at the end of that time in a state nearly as active as when it came from the kiln.

Rotation of Crops after Lime.—Much of the benefit attending the use of lime depends upon the rotation of crops that is pursued after its application. In the Preliminary Observations it was noticed, that upon some lands where lime had produced valuable crops for a few years, total barrenness was induced. Many instances of this are to be met with; and in all of these cases the mischief has been distinctly traced to bad management. Upon light soils, which are soonest exhausted, if several white crops are taken in succession after liming, the land will be rendered useless; accordingly the evil we have mentioned has uniformly happened upon such soil, and always from the same cause. The method of cropping, which experience has now proved to be the best after lime, is to take a white and a green crop alternately: with some it is the practice to sow wheat after the turnips, which must be a precarious crop, unless when sown in autumn, as is done in Sussex. Many intelligent farmers, however, in other parts of the kingdom, particularly to the north, never attempt wheat after their turnips. In place of it, they generally take a crop of barley or oats, which seldom fails to be good; and, along with these, they sow broad clover, which is for the most part ploughed down the second year, and a crop of oats taken off the ley. This last is generally the best crop of the whole; the oat stubble is then ploughed, as a preparation for another crop of turnips or

beans, with dung. By this management a white and green crop succeed in alternate rotation, and the land is preserved in a state of constant fertility.

Poor lands of this sort are oftener sown with turnips, broad-cast, after the summer fallow, and without dung. When sown in this way, the turnips seldom attain a great size; but what is wanting in bulk, is in some degree made up in numbers. A crop of this sort is generally valued at from twenty to forty shillings an acre, and is employed to advantage in feeding the young sheep, known by the name of Hogs, which generally thrive and get into good condition upon them. Turnips to these sheep are reckoned a preservation against the disease termed the Grass-ill; which in some seasons kills great numbers of them.

This last circumstance deserves particular attention; for if upon enquiry it is found that turnips prevent, or even palliate this distemper, a sufficiency may be raised upon every dry farm throughout the kingdom, by ploughing the wheat or oat stubbles immediately after the grain is cut, and sowing the turnips broad-cast; in this way they could not possibly arrive at any size; but the tops would afford a sufficient quantity of excellent herbage, which perhaps is the most valuable part of the remedy. If the crop be eaten upon the field, two material benefits would be derived from the practice: 1st. The sheep are fed, and the disease prevented. 2d. The land is greatly benefited; so much so indeed, that it is generally thought the produce of the succeeding oat crop will be increased two or three bolls an acre.

Rotation upon Clays with Lime.—The foregoing observations apply strictly to suit turnip soils. Upon clays the management will require to be different; on this species of soil turnips ought never to be attempted; not because they will not grow, for in favourable seasons valuable crops of them may be sometimes raised upon very strong land; but they are liable to so many accidents from wet weather, both before sowing and during their growth; and the inconveniences and loss that attend taking them off the land, even after they have arrived at maturity, are so great, that no prudent farmer would attempt to raise them, as the land is often more injured by carrying them off, than the worth of the most valuable crop.

Upon such lands a summer fallow seems indispensable; in that case the lime should be laid on in July or August, and completely harrowed in before ploughing: two or three furrows is the least that will be required to incorporate it thoroughly with the earth, and a suitable harrowing with each. The approved rotation upon strong clays with lime is,

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| 1st. Wheat. | 4th. Clover. |
| 2d. Beans. | 5th. Oats upon the Clover Ley. |
| 3d. Barley. | |

Rotation upon Muir or Heath-ground with Lime.—Upon lands where heath grows vigorously, no other plant can be successfully introduced without the assistance of lime: previous to its application, however, the heath should be burnt, and the land fallowed. The burning of the heath will not only prevent the operation of the plough from being interrupted, but will also suffer the sward to be more completely turned down, and the furrows to clap closer to each other; and the length of time that is allowed, together with the winter's frost, will both secure the rotting

of the turf and assist in pulverizing the soil. These two points gained, the lime may then be applied and well harrowed in ; and if the season is not too far advanced, a crop of turnips may be sown, broad-cast, and eaten off with sheep : this will be a good preparation for a crop of oats, which, in general, will be an abundant one. By this management we have known ten bolls of oats raised upon an acre of land, which before the liming was not worth half a crown yearly, and that too in very elevated situations. Grass seeds are generally sown with the oats, and the land either continued in pasture, or put under the rotation mentioned for poor turnip soils. To point out the proper rotation for all the different soils with lime, would be a tedious and indeed an unavailing task, as the gradations of soil are like the shades of colour, impossible to be defined ; we trust, however, that the above will be thought sufficient. Upon soils which are distinctly marked, such as clay, loam, muir, &c. the observations which have been made, will, we hope, be found just. Upon all the intermediate soils the judgment of the farmer must be employed, and according as he is able to class them with clays, loams, gravel, &c. they will be put under the rotation mentioned for any of these.

Having dwelt at considerable length upon the nature of lime, and the various methods of using it, we will now conclude the article with some general observations respecting its effects upon the different seeds, plants, &c.

It has been observed, that lime, both alone and in conjunction with alkaline salt, has the power of uniting with all oily and fat substances. Now, as all the seeds and plants with which we are acquainted contain more or less oil, lime will have a proportionable effect upon them. Lime also probably acts by killing insects, as well as destroying vegetables, which thus furnish nourishment to the plant to be produced. It may be considered likewise as a stimulus to the plants, and as operating mechanically, by dividing the soil and absorbing water.

The seeds of most annual weeds contain oil in considerable quantity, particularly the different kinds of mustard. These are the greatest enemies that farmers have to contend with, particularly upon light free soils, where, if a shower accidentally falls immediately after the field is sown, a thick crop of annuals immediately comes up, and very effectually ruins the grain.

The cause of this failure has generally been ascribed to the annuals choking the corn. No doubt this is partly the reason : but the real cause seems to be the immense quantity of oil and useful principles that are extracted from the soil by the annuals, and which exceed in an uncommon proportion the nourishment that is required to produce the most luxuriant crop of grain. These *annuals* indeed occupy the ground, and get the food which were destined for the crop intended to be obtained.

This accounts in a very satisfactory manner for the greater degree of poverty that is observed in land after a bad than a good crop : every farmer of experience is sensible of this. Indeed there is no crop with which we are acquainted that exhausts the soil so much as these annuals, except rape, when the seed is ripened ; or hemp and flax ; and their exhausting effects are owing to the same cause.

Upon soils which abound with these seeds, lime will be found an effectual remedy, if judiciously applied : indeed, in whatever form it is used, it will destroy them in a certain degree : but if it is thoroughly incorporated with the earth, and the field

laid down to grass, the effect will be more certain, as the lime will not be disturbed in its operation upon the seeds, which it is liable to be in cases where the land is kept in tillage. Where this plan is followed, and the ground allowed to remain in grass for two or three years, at the end of that time the annuals will be found destroyed, with this additional advantage, that they will be converted into rich nourishment for the grain that is afterwards sown. This last is no inconsiderable object; for whoever considers the immense numbers of annual seeds which are in all light soils, will be convinced that a very considerable quantity of nourishment, and that too of the best quality, will be acquired by their destruction. To destroy weeds in the first instance, is certainly an important point gained; but to convert them into manure for the grain, is turning a nuisance into a benefit. Nor is this the only advantage that is gained; snails and other vermin which are particularly baneful to green crops, are also destroyed.

These circumstances, while they hold out to practical farmers a prospect not only of destroying weeds, but also of enriching the soil, enable them at the same time to take precautions against their useful crops being injured by the same cause. All the different grains, and the seed of that useful plant the turnip, contain oil in considerable quantity; and if any of them are sown upon land where lime is in an active state; if the ground is dry and no rain falls for some time after they are sown, the seeds will be very much injured, a considerable part will be entirely lost, and the remainder, though they vegetate, will be sickly and imperfect.

In a field that has suffered by drought in this way, if the seeds which have not vegetated are picked up and carefully examined, they will be found light and shrivelled: an appearance which has generally been ascribed to the action of the heat. This, however, is by no means the case; for, as shall be afterwards shown in the Appendix, all the different sorts of grain and turnip-seed may be exposed to a much greater degree of heat than they are likely to meet with in the earth, without any risk of their being hurt. We need hardly add, that it should be a principal object with every farmer to conduct his operations in such a way as to retain a sufficient quantity of moisture in the land to vegetate his plants immediately after they are sown: that point once gained, they are in no great danger of being hurt by dry weather thereafter.

Necessity of giving a thorough Liming at once.—Considering lime as a substance operating upon the living substances contained in the soil, as well as mechanically upon the soil itself, we can readily perceive the utility, and even necessity, of applying a sufficient quantity of it at once, in order to produce these effects; for if the quantity employed is small, and the soil deep, its effects will scarce be visible. Hence we can distinctly perceive how a small quantity of lime laid upon particular soils will often be lost; whereas a larger dose would have been highly beneficial. This circumstance has led many farmers to imagine that lime would not answer upon their lands, and of course to abandon the use of it; whereas a little judgment would have convinced them, that the miscarriage was owing not so much to the lime being improper, as the quantity being too small.

This leads us to notice the practice in many of the English counties, where the farmers are obliged, by their leases, to lay on a certain quantity of lime every three or four years. We have perceived the accounts of these counties with singular

attention, and have thought seriously of the reasons that could induce proprietors to propose, or farmers to agree, to such absurd stipulations. In districts where the generality of the farmers are tenants at will, it is reasonable to expect that landlords will guard their property by restraining clauses. This certainly is right; and if covenants are more necessary in one situation than another, it is in the case of a yearly lease. But to oblige a farmer to lay a given quantity of lime upon lands of every description, every two or three years, carries absurdity in the face of it; for it is well known that every difference of soil requires a different quantity of lime. If the quantity therefore which the tenant is obliged to lay on is sufficient for his heavy lands, it will be more than an overdose for his light soil. This is the first inconvenience that attends a covenant of this kind. The second is more serious; for if the first liming is sufficient, a repetition of it at so short a distance of time, would be highly injurious. It is argued in defence of the custom, that the quantity is in general so small, that it has no very great effect upon the soil, and that it will bear to be repeated frequently before a sufficient dose is given. This argument however is nugatory; for we have already shewn that a small quantity of lime can never produce any beneficial effect, except upon the very lightest soils; and as to its remaining in the ground till a sufficient quantity is thrown in by repeated doses at the distance of two or three years, nothing but the grossest ignorance and folly could make any person expect it; for even where a complete liming is bestowed upon land, a very great proportion of it is found at the bottom of the furrow after the second year; and we have no reason to expect that it will be otherwise when a small dose is applied. But, independent of this circumstance, lime that has lain three years in the ground will have imbibed so much moisture and fixed air, that it will be nearly in the state of unburnt limestone; consequently will possess little or no activity. In short, reason and common sense enter the strongest protest against the custom, which is founded in ignorance, and ruinous both to the farmer and the soil. Indeed there is no covenant between landlord and tenant so effectually calculated to defeat its own purpose; for while the landlord is flattering himself with the hope of enriching his property, and the tenant is bestowing labour and money for that end, the plan is rendered abortive, and the land reduced to a *caput mortuum*. For though lime, under proper management, is of advantage to most soils, yet the quantity must be exactly regulated by the nature of the particular soil.

We are of opinion therefore, that a complete dose of lime should always be given at once, and that this liming should be regulated by the deepness and other known qualities of the soil; for it cannot be too often repeated, that what is a sufficient dose for one soil, will hardly be felt upon another; but when this quantity has once been laid on, it ought never afterwards to be applied by itself.

But though we thus interdict the repetition of lime in a simple state, at least for many years, we entertain a high opinion of its value in the form of a compost. In its naked state it produces the effects above mentioned; and these points being gained, a farther application may be hurtful; but when made into a compost, it feeds in place of stimulating the earth, and its action is exerted in dissolving and reducing to a state of complete putrefaction the substances with which it is mixed. In this way lime may be used for ever, even upon the same soil, provided care is taken to mix it well with good dung and new earth; and if the English landlords, in place of

the present injudicious covenants of liming every two or three years, were to propose to their tenants to lay on a compost of lime, dung, and earth, either for their turnips or wheat, both parties would be gainers by the change.

The foregoing circumstances, while they explain the danger of overliming land, at the same time point out a remedy for the injury. As was formerly said, the quantity of lime employed ought always to be regulated by the quality of the soil; in all cases therefore where the lime has been in too great proportion, a considerable quantity of it will remain in an active state, after destroying the animal and vegetable substances; while this is the case, it is in vain to expect that good crops can be raised; the application of mucilaginous and oily manures can alone repair the injury; and, if they are used in sufficient quantity, they will answer that end very effectually. Stable-dung, sea-weed, oil-cake, garbage, &c. &c. are the substances that abound most with mucilage and oil; and, by the use of them, every bad consequence attending the excessive use of lime may be obviated. It is to be noticed, however, that a succession of white crops is to be avoided after the application of these rich manures, and the land laid down to grass. By this management for a few years, its vigour will be restored.

We cannot conclude this article without recurring to the manner of mixing lime with the soil. We have said, that in order to be useful, it should be well incorporated with the earth, and that frequent ploughings and harrowings are the only means to be depended on for that purpose. The first thing to be noticed is the spreading: this operation should be performed with the utmost care, and, if possible, always done in calm weather; for if the wind is high, a part of the ground will be whitened by a thin coat blown upon it, which will deceive the person who spreads it; whose eyes being annoyed by the lime, will not enable him to distinguish between the spots that are thus whitened by the dust, and those that have got a proper coat: even with every possible care the spreading will be unequal; so much so indeed, that a common harrowing will not mix it properly. To obviate this in some degree, bush-harrowing should be practised in the following manner: A quantity of furze or thorns should be put under a pair of common harrows, or even a brake, the heavier the better, and the land completely harrowed with them. The common harrows should then be used without any furze; and in this operation it is hardly possible to do too much, for the oftener the harrow goes over the land, the more intimately will the lime be mixed with the soil. The next thing to be attended to is the subsequent ploughings: and here it may be proper to observe, that they should never be very deep, particularly if the quantity of lime has been moderate; for if the soil is deep, and the quantity of lime small, very deep ploughing would not only bury a part of the lime, and place it beyond the reach of being useful, but would mix it with too great a quantity of earth. To prevent this, when lime is ploughed in, the first furrow should not be more than two or three inches deep, and the subsequent ploughings should never exceed four inches; by this means the lime, as well as the soil it has acted upon, will be kept uppermost, and rendered useful; whereas by ploughing deeper, and mixing it with more earth, the benefit would not only be less, but also more uncertain.

One mode of using lime may here be mentioned: which is the most curious circumstance in British husbandry, connected with this species of manure, namely the

application of 500 or even 600 bushels per acre, on peat soils or moors ; and thus without any additional trouble whatever, raising them from one shilling to twenty shillings and twenty-five shillings per acre ; which has been done in the Peak of Derby. It is evident, however, that this can only be effected where limestone is in great abundance, and where fuel for burning it is cheap.

XXVIII. UNBURNT LIMESTONE.

Unburnt limestone differs from quick-lime, in containing fixed air : an acid now called by modern chymists, Carbonic Acid. In this state the lime readily attracts other acids, but does not unite with alkaline salts ; and its operation upon animal or vegetable substances is consequently small. It is therefore less active than quick-lime, and should never be used but in situations where fuel cannot be had to burn it.

Attempts were made by the late Lord Kaimes, one of the judges of the Court of Session in Scotland, to pulverize limestone for manure ; but we have not been able to obtain satisfactory information as to its utility. Indeed it is hardly to be expected ; for admitting that it were equally active with quick-lime, which is far from being the case, there is no possibility of breaking it sufficiently small to render it useful.

In the very remote parts of the country, however, it may be deserving of notice, particularly in those situations where limestone abounds, without fuel to burn it. In such cases, if means can be fallen upon to break it sufficiently small, it will be found useful ; but we despair of seeing it reduced to practice upon an extensive scale, as the expence of breaking it will, in most cases, be greater than the advantage derived from its use. The only possible way in which it can be done to any extent is, by machines to go by water, or by steam, upon principles similar to the large hammers used at iron mills. Chalk, stone, marl, and sea-shells may be broke in the same manner.

XXIX. CHALK.

Chalk in its native state is useful as a manure, upon nearly the same principles as unburnt limestone, marl, and other calcareous earths ; but it will be found more useful than limestone, because it can be more readily pulverized, and because it is lighter or more porous. It is to be observed, however, that nearly the whole of chalk is calcareous earth ; whereas the richest marl we know contains scarcely a fourth part of its whole weight of that valuable ingredient.

The quantity of chalk laid upon soils of every description, will consequently require to be less. This observation applies to chalk in its natural state ; when burnt, it possesses every property of lime, and ought to be used exactly in the same manner as other lime.

The greatest benefit derived from chalk is in the southern counties of England, where it abounds, and where it is in high esteem. Its best effects are upon deep soils, and thin poor clays, which contain no calcareous earth, for it is observed to have very little effect upon lands where the substratum is chalk ; and if the soil is thin, it does mischief. When used upon light soils, it is made into compost with

earth and dung, in such proportion, that the active quality of the chalk may balance the inactivity of the dung. When these compounds are well mixed and duly proportioned, they produce valuable crops, and their influence continues for many years.

The ordinary method is either to lay the compost upon fallows for wheat, and mix it intimately with the soil, or upon grass as a top-dressing: in both cases it answers well; in the latter, it destroys moss, rushes, and all coarse aquatic plants that grow in sour or wet lands; and in the former, it opens and pulverizes the soil, and never fails to produce good crops.

When chalk is used without burning, in order to insure the utmost advantage from its application, it should be broken as small as possible. This operation will be rendered easy and certain, if it is dug near the end of autumn, and laid upon the land immediately after; at that season the air is generally moist: this moisture will in part be absorbed by the chalk, which will occasion it to swell and break in pieces; and if frost comes on while it is filled with the moisture, it will accelerate the business; but when it is dug in summer, and exposed to a warm dry atmosphere, it loses its humidity and acquires a degree of hardness, which in a great measure prevents it from being useful. When spread upon land, labourers should be employed to break any large pieces with wooden mallets. This operation, which some may think unnecessary, is essential; for these large lumps produce little or no effect; whereas when they are broke, and equally spread, they will mix with the soil and operate upon it; and in no case should chalk be ploughed in till its parts are properly separated, as, unless this is done, it cannot be expected to have any considerable effect. As we formerly observed, when speaking of lime, unless chalk is completely harrowed in, and well mixed with the soil, it has no great chance of being useful.

With regard to the practice of mixing dung with chalk, that should be regulated by the nature of the soil upon which it is laid. If the soil is thin and light, a certain proportion of dung will be useful; but if it is heavy, the addition of the dung will be unnecessary, as it will only tend to lessen the operation of the chalk. Upon lands which have been completely chalked, a repetition will be improper; but though it cannot be administered a second time in its naked state, it may with great advantage be used in the form of a compost; for it is observed in the southern counties where chalk is much used, that if a field of land that has been chalked is laid out into stripes, and one part of it chalked, and another dressed with chalk and dung, the former will produce a very bad, and the latter a very good crop.

Finally. Though no mention has been made of the exhausting effects of chalk, yet we believe, that, beyond a certain quantity, it will not only cease to operate as a manure, but will even prove hurtful. It ought therefore to be employed with caution, and due pains taken not only to ascertain the strength of the chalk, but also the quality of the soil upon which it is laid.

XXX. LIMESTONE GRAVEL.

Limestone gravel is a mixture of calcareous stones or earth, and other stone or earth, but principally flinty or sandy earth. It is a considerable article of manure in Ireland,

and must answer wherever it is found. There is some reason to believe, that it may be obtained in some parts of Scotland; and it certainly would be a most valuable acquisition, could it be discovered in any quantity.

XXXI. MARLS.

Marl is a substance containing calcareous earth, found in the bowels of the earth in different situations, and at various depths. Its use is common throughout the whole of Great Britain; and experience has proved it to be of great value in husbandry. It is differently named, according to its ingredients. viz. *Clay-Marl*, *Stone-Marl*, *Slate-Marl*, *Shell-Marl*.

Clay-Marl.—Clay-Marl is so called from its resemblance to clay, of which it contains a considerable quantity in its composition. It is of many different colours; but all of these agree in one material point.

Stone-Marl.—Stone-Marl is so called on account of its hardness; and differs from the former in being less easily soluble in water.

Slate-Marl.—Slate Marl is found in thin laminæ, or layers, like slates, and is of a consistence harder than clay, and softer than stone-marl. This substance is also of difficult solution in water.

Shell-Marl.—Shell-Marl is distinguishable from every other substance of that name, both by the shells it contains and the cohesion of its parts, as well as its specific gravity being less than either of them. It is most frequently met with in situations where the ground has formerly been covered either by lakes or pools of stagnant water. When the shells are in a fresh state, and covered with the enamel upon the outside, shell-marl is of very little value; but when they are in a decayed state, it is by far the richest and most efficacious of any that we are acquainted with.

The benefit of all marls in agriculture is, in a great measure, owing to the quantity of calcareous earth which they contain; and according as they possess more or less of it, they are more or less valuable. The principal distinguishing mark of good marl is its effervescing readiness with acids. This circumstance, while it proves the existence of the calcareous earth, may be made use of to determine the quantity of it; which is a matter of consequence for farmers to ascertain. The following will be found a very certain test of its strength:

Take a given quantity of marl, highly dried in the sun, or kept very hot in a shovel for half an hour over a fire, and finely powdered; mix it with water, and add strong spirit of nitre, drop by drop, till the effervescence ceases, taking care to keep an exact account of the number of drops: Then take an equal number of drops of the same acid, and put them into a glass, with half a spoonful of water. Take also a given quantity of unburnt limestone, of the best quality, finely powdered; add the limestone by little and little, shaking the glass well every addition that is made, till the effervescence ceases; the quantity of acid being equal in both cases, the quantity of unburnt limestone required for the second experiment will be exactly as the quantity of calcareous earth contained in the marl made use of in the

first. By knowing this, farmers can pretty certainly determine the quantity of marl necessary for an acre.

It must however be observed, that the calcareous earth, in all marls, from its containing fixed air and moisture, has a much less powerful operation upon the rich parts of the soil than lime. This circumstance ought to be particularly attended to, as it will require a much greater proportion of the calcareous earth contained in marl to produce a proper effect, than it will of quicklime.

In speaking of lime as a top-dressing, we reprobated the use of it in very strong terms. The same objections, however, do not apply to marl; for the calcareous earth, in all sorts of it, is in the same state as unburnt limestone, consequently it possesses none of the caustic qualities of quicklime, and may with safety be employed as a top-dressing upon most crops, particularly upon light thin soils. In these situations the clay and earthy principles contained in the marl, will both add to the thickness of the soil, and give a degree of firmness and cohesion to its parts. It will also have the effect of destroying the wild sorrel with which certain sorts of thin light soils are often infested, and will sweeten and correct that acidity which is the cause of its growth.

With regard to the utility of marl upon low meadows we are doubtful, particularly if they are coarse and rushy. To make it useful in such situations, it will require to be laid on in very considerable quantities, and, in all probability, will correct the acidity of the soil as readily as lime; but its action upon the rich useful principles contained in it will scarcely be perceived; whereas lime, in such cases, not only kills the coarse plants, such as rushes, &c. but accelerates their putrefaction. Another circumstance to be noticed is, that the earthy part of the marl, which is so useful upon light soils, is lost upon wet meadows, as they stand in need of no addition; the soil of all, or most of them, being deep and rich.

In all cases therefore where *lime* and *marl* can be obtained with equal ease, a preference should be given to lime for deep soils and coarse meadows; and to marl for high, thin, gravelly lands, especially if much wild sorrel grow upon them. There is scarcely a shape in which marl can be used with such propriety as upon these light lands, when they are in grass. The experience of farmers in those parts where marl is much used, abundantly confirms the truth of this doctrine; and perhaps by the use of marl in this way, with the assistance of top-dressings of compost afterwards, all poor thin gravels, and even sand, may be rendered more valuable than by any other mode of management. †

But though we have thus decidedly given the preference to the use of marl upon light soils, we by no means wish it to be understood that it ought not to be applied upon any other: on the contrary, we think that upon strong clays, if a sufficient quantity is employed, it will be highly beneficial. Every description of marl, however, will not answer for this purpose: clay and slate-marl upon stiff lands will increase their cohesion, and in place of serving, will injure them; but if shell or stone-marl are used, the soil will be rendered open, and by its cohesion being broken, the water will find a readier passage through it; of course the land will be rendered deeper; the advantage of which every farmer knows.

Besides these above described, there are two other substances, which from their appearance greatly resemble marl: the first is a soft unctuous substance, of a mot-

† Marl, it is commonly supposed, answers best for producing grass; and lime for grain.

bled appearance, which upon examination is found to consist of a fine clay, of easy diffusion in water, joined to the earth of magnesia. This substance does not effervesce with acids; but from knowing its component parts, we can pronounce that it will be valuable in all situations where marl is useful. The origin of this substance is evidently a *decompounded whin-stone*.

The last substance that comes under this description is generally of a bluish colour, and has very much the appearance of stiff clay-marl. The use of it has in numerous instances been found highly pernicious. Where farmers, deceived by its appearance, have employed considerable quantities of it without due examination, when analyzed, it is found to contain a great proportion of green vitriol iron, joined to an acid; both of which are known to be vegetable poisons.

A very simple experiment will serve to discover the presence of iron in this substance; for if a small quantity of it is burnt in the fire with a little oil, and the piece afterwards beat small, and the magnet applied to it, the iron will adhere to the magnet. Another method is, to boil a quantity of it for an hour or more, either in river or rain water, then strain and evaporate the fluid to dryness. If it contains iron, a powder will remain at the bottom, which, if dissolved in water, will strike a deep black colour, with an infusion of galls.

The above are the whole of the substances which either come under the denomination of marl, or have any resemblance to it. Before concluding the article, we think it necessary to take notice of a practice that prevails in some parts of burning the marl. By this process the calcareous earth will, no doubt, be rendered more active; being changed into the state of lime.

For the use of Marl on Bog, the reader is referred to the Lancashire Report, p. 39.

XXXII. SEA-SHELLS.

All testaceous substances are principally calcareous earth, and when burnt afford the best of lime-shells; in a sound state are of very little value as a manure, unless they are broke very small; even then, their operation is trifling; but when they are found in a decayed state, they resemble shell-marl, and will be useful in all similar situations. The rules laid down for the use of chalk in its natural state, apply exactly to decayed shells; the principles contained in both being the same. The practice of burning shells is equally useful.

Shells are plentifully used upon the sea-coast in many parts of Britain; and in several instances with singular advantage, particularly upon deep loams and strong clays, where their operation is similar to chalk or marl; but upon light gravel or sandy soils, little benefit is to be expected from their use, unless they are previously made into composts with dung, clay, or loams. In this form they will not only operate as a manure upon light lands, but will also bind and thicken the soil.

When such lands are in grass, top-dressings of this compost will produce excellent effects; and if judiciously treated afterwards with dressing of any of the different earths, their value will be improved in an astonishing degree; and the thinner the soil the greater will be the profit arising from this management. Upon thin clay-pastures, shells in their simple state will likewise produce good effects, as they will correct acidity, destroy rushes, and render the soil less retentive of moisture.

These observations are confined to cases where shells are employed in their simple state: when they are burnt they are in the state of lime, and must be used in the same manner as lime, and will be found equally beneficial.

In many parts of the kingdom, however, this article of manure is little attended to, though immense quantities are to be had with little trouble, particularly upon all the flat parts of the coast; there they are generally found in beds of considerable thickness, and so much decayed, that they crumble down when touched. While we regret this neglect, we entertain a hope that the attention of the public will soon be directed to every branch of this subject, and that in a few years no cause for a complaint of this sort will exist.

The proportion of calcareous earth contained in decayed shells, may be determined in the same manner as marl.

XXXIII. POT-ASH; OR, FIXED VEGETABLE ALKALI.

This substance has hitherto been little used as a manure, though it forms an essential component part of all the fertilizing substances we know. It is an active principle in all vegetable manures, remains fixed in the fire, and is one of the most valuable articles obtained by paring and burning.

In speaking of the operation of lime, we observed that its effects were varied by an union with alkaline salts. This compound is better calculated to promote the putrefaction and dissolution of animal and vegetable substances than either of these can do in their simple state.

In the most favourable situations, any thing that will increase the quantity, or improve the quality of manure, is highly valuable; but in places possessing few natural advantages, and far removed from the means of improvement, any thing that can be a substitute for the ordinary manures will be eagerly sought after, especially if the article is of easy carriage, and can be purchased at a moderate expence.

From a knowledge of the qualities of pot-ash, and careful trials of its effects, which will be seen in the experiments to be afterwards narrated, we are led to consider it as the cheapest manure that can be employed in the remote parts of the country. The first cost of the article is not great, and the quantity requisite for an acre so small, that the expence of carriage will scarcely be felt; as one cart, upon good roads, will be able to carry a load sufficient for six or eight acres.

In the experiments to be mentioned, little more than 200 lb. were found sufficient for an acre; but this was upon a deep soil, containing a very considerable quantity of animal and vegetable substances; for lighter soils, however, much less will be required, if laid on by itself: indeed, upon very light soils, a compost prepared with pot-ash and oil, incorporated with mould, will be the best way of employing it. In this state it will, if applied as a top-dressing, very liberally reward the labour and expence of the farmer. Upon strong clays and deep loams, however, it ought always to be applied by itself, especially upon these lands which the farmers call Dead with over-manuring; and when the expence of carriage is considered, pot-ash will be found a cheaper manure than lime. In one respect it

is greatly superior to it, as the union of pot-ash with all the different acids forms a neutral, which is in some degree useful in vegetation; whereas when lime meets with the vitriolic or sorrellic acid, it is almost entirely lost.

It may probably be said, and with much appearance of justice, that in a country like Great Britain, where the present supply of pot-ash is so nearly proportioned to the consumption, any attempt to introduce the use of it as a manure would serve only to enhance the price, and by that means prove injurious to the manufactures in which it is at present employed. At first view, this appears to be a solid objection; but a little attention to the subject will shew that there is no serious cause for alarm on that account, as a very considerable part, if not the whole of what is at present used in manufactures (glass excepted) will be found extremely useful as a manure, after the purposes of the manufactures are answered with it; besides, if the duty upon importation be taken off when it is used as a manure, and even a small premium held out to importers, double the quantity usually brought into the country might be obtained; and as the places from whence it is brought abound with extensive forests, there is little risk of its being soon exhausted.

In the various manufactures in which pot-ash is used, there is none from which so much can be recovered as bleaching; nearly the whole of what is employed at every field may be saved after the purpose of the bleacher is answered with it; and, what is an additional advantage, the alkali will be found improved, in consequence of containing mucilage or oil by its operation upon the cloth.

It is well known that the effects of pot-ash in bleaching, depend entirely upon its quality of dissolving the oil, mucilage, or colouring matter, contained in the flax of which the cloth is made; and as a given quantity of pot-ash can only dissolve a certain proportion of substances, whenever it has accomplished this purpose, the bleacher has done with it. In place therefore of throwing it away, as is daily done at every bleachfield in the country, if it were carefully collected and sold to the neighbouring farmers, a double benefit would result to the community; first by lessening the expence of bleaching, and next by the acquisition of a cheap useful manure, which is at present lost.

If upon trial this opinion shall be found just (and we entertain no doubt of it) there will be little difficulty in bringing a sufficient quantity of it into the market. At any rate, if no other advantage should arise from this hint, but merely the saving of what is daily thrown away at every bleachfield in the kingdom, even that will be found considerable, as there are few bleachfields of any consequence but would afford a quantity of lye sufficient for a top-dressing to many acres.

XXXIV. KELP.

Prepared kelp has seldom been used in agriculture, though upon trial it will certainly be found a good manure. It is a mixture of fossil alkali or soda, and sea-salt, besides earths or stones. All marine plants abound with this alkali.

The operation of kelp as a manure will depend upon the same principles as lime, pot-ash, &c. &c.; like them, it will produce the best effects upon deep loams, clays, or tills: upon these the use of it will be attended with singular advantage; and

this benefit will be still farther increased, if a certain proportion of lime is made use of along with it. The principal difficulty that occurs in the use of kelp, is the firm adhesion of its parts when it is prepared in the ordinary way: previously to its being used as a manure, it ought to be broke very small, either with large hammers, or passing it through a mill. Thus prepared, it may be employed either by itself or in conjunction with other substances, according to the nature of the soil upon which it is laid, observing the same rules laid down for the use of pot-ash.

Perhaps, in the present way of preparing kelp, it will never be had in sufficient quantity to render its use general as a manure; but as the fossil alkali is known to be a principal component part of sea-salt, we entertain a sanguine hope that chemistry will soon be able to discover a method of separating it in sufficient quantity to answer every useful purpose. A manufacture for this purpose has been lately established at Liverpool, which promises to be successful; and it is hoped, that the fostering hand of Government will lend every aid to so useful an undertaking, by granting a small bounty upon every ton prepared from sea-water. If even this manufacture is carried to any height, and the process so simplified as to afford the article at a low price, it will be an object of the first magnitude, both with regard to the manufactures in which it is at present employed, and to the agricultural interest of the kingdom.*

XXXV. BLEACHERS ASHES, OR REFUSE.

Bleachers ashes, or refuse, are employed as a manure in many parts of England. They consist principally of the hard undissolved parts of *pot-ash*, kelp, weed-ash, and barilla. Alone they are too stimulating, and ought never to be used but in conjunction with earth, or earth and dung; they will likewise answer well if mixed with *blood*, *garbage*, and putrid animal substances. They are generally laid upon fallows for wheat; and when judiciously used, are found to produce very good effects. The greatest advantage derived from their use, is upon clay or deep loams: upon sandy or gravelly soils they are totally inadmissible, unless they are made into compost with rich animal or vegetable substances.

Upon rushy ground, or coarse wet meadows, they will be found particularly useful: in such situations they should be employed by themselves, as in their naked state they more effectually destroy aquatic plants than when made into composts.

• Kelp, tried as a compost in the following manner, was found to answer particularly well. About a ton and a half of kelp was beat remarkably small, to which was added half a chaldron of unslacked lime. They were well mixed under cover, and after being mixed for a week or ten days, they were put on the top of a compost, consisting of 100 loads of soil, scrapings of the streets, &c. It remained there some months before it had the first turning: it had in all three turnings (taking care that none of the kelp lay at the bottom) and in about three or four months it became an excellent compost, either for tillage or old sward. There can be no doubt that kelp only, after the first mixture with unslacked lime, would make an excellent dressing for turnips, to be sown out of a hopper by hand immediately after the turnip seeds, and before the ground is rolled. *Survey of the Northern Districts—Orkney Report.*

XXXVI. SOAP-ASHES.

Soap-ashes are, in some measure, the same as the refuse of bleachfields. They principally, however, consist of lime which is employed by the soapmakers to deprive the alkaline salts of their fixed air, and by that means increase their action upon the oil and tallow. The addition of lime to soap-ashes is therefore unnecessary: they are generally made into composts with earth, and well fermented dung, in the proportion of two loads of dung to one of earth; the ashes are then added in the quantity of one load to ten of this mixture, taking care to turn and incorporate the whole completely. The quantity necessary for strong clays, or deep loams, is about ten cart loads of this compost to an acre. If the dung has been well fermented, and properly reduced, perhaps the most profitable way of using this article will be as a top-dressing harrowed in with the grain: care however should be taken when it is employed in this way, that the caustic quality of the ashes is properly blunted by a sufficient mixture of dung and earth; for if this circumstance is not attended to, and dry weather follows the sowing, there will be a considerable injury to the seed.

These ashes, when beat small, may be made into a very rich compost with oil and earth, and used as a top-dressing for young crops. In whatever shape they are used, they will be found to destroy slugs and vermin of every description. This quality will render them highly valuable upon lands where the early wheat is injured by the worm. If they are either applied as a top-dressing, and harrowed in along with the seed, or used upon the young wheat in the spring as soon as the worm appears, the evil will be completely prevented: perhaps mixing it well with the soil at seed-time will be found preferable, as it will have a chance of killing the vermin in embryo. When laid upon grass lands in the end of autumn, this manure produces a deep verdure during the winter, and an early and vigorous vegetation in the spring; it is therefore particularly calculated for cold wet pastures.

XXXVII. SOAP-LEY.

Soap-ley consists of alkaline salts and oil, and is produced by the dissolution of soap in water. The instances in which this article has been employed as a manure are few; but the success of some experiments that have been made, has been sufficiently great to attract the attention of the public; and should future trials be equally favourable, we hope much less soap-ley will be thrown away.

The quantity of this article that is daily wasted about every town and village throughout the kingdom, is immense; and, if properly collected, would be found a valuable addition to the manures we already possess*. When collected, if it is found inconvenient to spread it upon the field immediately, it may be mixed with earth, or earth and dung; and in that form will be found an excellent compost. Indeed, in whatever way it is used, it will insure one or two good crops; but if made into a compost, its effects will be more permanent.

* In China they are so attentive to minutiae in regard to manure, that barbers are said to preserve carefully the soap-suds they have made use of.

XXXVIII. FERN-ASHES.

Fern, which abounds in the wastes in many parts of Great Britain, is used as a manure in two different ways. In the first, it is cut and used as litter; in the second, it is burnt, and the ashes used either by themselves, or made into composts.

The first is undoubtedly an excellent practice; the last we decidedly condemn, unless in situations (if there are any such) where there are no horses or cattle to rot the fern. No vegetable affords an equal quantity of pot-ash; hence the poor people in many places burn them, and lixivate the ashes for bleaching and washing linen. When the fern is burnt, the alkaline salt is the only useful principle that is obtained; whereas by using them for litter, they are subjected to the process of fermentation, and the whole of their useful parts preserved. In this way they will be found to improve stable dung, by the great quantity of alkaline salts which they contain, and which will communicate a degree of activity to that article, which it does not possess, when made in the ordinary way, where straw only is used for litter.

When fern is burnt (a practice as little to be recommended as that of burning straw) the ashes ought never to be used by themselves, unless upon the heaviest and deepest soils, for corn crops, or upon wet sour meadows: upon all other lands they should be mixed with dung and earth. In short, the same precautions that were mentioned for pot-ash, kelp, &c. &c. apply to fern-ashes; like these articles, they are highly improper upon light soils, unless when well mixed with other substances; and are equally used upon stiff clays or deep loams when employed by themselves.

Considering the valuable qualities of fern, it is a matter of equal surprize and regret, to see immense quantities of it decay every year, upon many of the extensive wastes and commons, where they go by the name of Brakes and Brakens; which name the country people in many parts apply to every thing that they consider as poor and worthless. In many of these situations, several hundred loads could be saved yearly, and converted into useful manure, which are suffered to decay and be lost; and what makes this neglect the more unpardonable, is its being most frequent in those parts where the means of improvement are few, and the most difficult of access.

Besides the manure that is thus acquired, another, and an essential advantage would be gained, by giving the cattle a dry bed. In some places it is disgraceful to see the poor miserable animals confined in a wet yard, and wading to the knees in mud; while at a mile distance abundance of dry fern might be had, which would not only afford them a comfortable bed, but would also absorb and retain their urine and other excremental matters, which generally run out of the yard and are lost.

Though this may be thought an improper place, to introduce any thing foreign to the article we are speaking of, yet we cannot help noticing, that every kind of coarse herbage, which sheep or cattle will not consume in the field, ought to be carefully collected and used as litter. Coarse bent, ling, and even heath, will answer this purpose well, and may be completely rotted; and even if they should

is found less valuable than other manures, the difference will be more than compensated, by the benefit the cattle derive from lying dry. This may be considered as one of the many ways of increasing the quantity of manure; and the advantages attending it will be the more sensibly felt, as it admits of being most easily practised in situations where manure is scarce, and where even a small quantity cannot be purchased.

Ferns ought always to be cut before they are decayed; for it is worth observing, that all plants which contain much fixed alkali, when withered, are liable to be robbed of it every shower that falls: care should therefore be taken, to cut them a considerable time before they begin to fade; and when they are properly dried, they should be built into stacks, there to remain till they are wanted for use. Indeed they are preserved in many parts of the Highlands, and used in this way.

With some it is the custom, to litter the whole yard, to a very considerable thickness at once. This practice is improper; for if much rain fall soon after they are laid down, they will not only be completely wet at once, and by that means the cattle obliged to sleep upon a wet bed ever after, but a very considerable part of their salt will be lost: whereas by laying down a quantity sufficient only to absorb the urine, and afford the cattle a dry bed, removing that entirely at the end of every five or six weeks, and replacing it with more, the yard would always be kept comfortable for the cattle, more dung would be made, the quality would be better, and it would be sooner fit for use; for every time the yard is cleaned, if the quantity removed is laid up in heaps, with the urine and excrement of the cattle which it contains, it will sooner ferment than if it is allowed to remain amongst the cattle's feet; and when treated in this way, would be doubly valuable.

This observation applies equally well to all manure made in this way, whether the litter made use of is fern or straw; as much dung is lost by allowing it to remain in the straw-yard, and be trod upon by the cattle during the whole winter.

XXXIX. PEAT-ASHES.

Peat is burnt in many parts of Britain, and the ashes used as a manure. They are principally employed as a top-dressing upon clover or clay lands, and when rain falls immediately after, the crop is benefited by the use of them; but when used upon thin soils, and dry weather succeeds, they produce little or no effect; on the contrary, they often do harm, especially if they have been prepared from the richest sort of peat.

There is no substance the qualities of which are so different in different situations as peat; what is found in some mosses, containing a considerable quantity of fixed alkaline salts, while that of others contain scarce any. They all agree, however, in affording more or less alkali when burnt; and the value of their ashes depends entirely upon the quantity of fixed alkali which they contain; for the burning of peat, like every other vegetable substance, is utter destruction to all its other component parts; the whole of the oils being dissipated in smoke, and the vegetable

earth, which forms a very considerable part of the bulk of all moss, is rendered entirely useless.

From a careful analysis of moss, we have ascertained the proportion of fixed alkali contained in it, to be from a twenty-second to a thirty-second part of its weight. In situations where the stratum of moss is thick, and so rich as to afford a twenty-second part of its weight of fixed alkali, it may be an object to burn it and employ the ashes as manure; but less trouble and very small expence will subject it to the process of fermentation, by which the whole of its oil and vegetable earth will be saved. This point has already been discussed under the article of Animal Dung.

When rich peat-ashes are employed as a top-dressing, eight or ten bushels will be sufficient for an acre; and when they are used upon wheat or any of the young crops, they ought always to be laid on before the plants have attained any great size, for when the plants are young the ashes will get down to the ground; whereas, by delaying it till they have attained a greater size, the ashes hang upon the leaves and do mischief. A wet cloudy day is most proper for this purpose, as the ashes are immediately carried into the earth by the moisture.

Perhaps, upon all corn crops where these ashes are used, it would be as well if they were sown and harrowed in along with the grain: in that way they would be equally efficacious, and there would be no danger of their being hurtful. They may be used with great propriety upon fallows for wheat or barley: in these cases a greater quantity will be necessary than where they are used as a top-dressing; perhaps three times the quantity will be requisite. When used in this way, the same pains should be taken to incorporate them with the soil as we recommended for lime, &c.

To the above we beg leave to subjoin an account of the manures made from peat, in Bedfordshire, as communicated to the Board.

"It is well known," says the writer of this account, "that peat may be converted into manure, either by mixing it with lime, putting it into a dunghill, or making it into a compost. In some counties of England, particularly Bedfordshire and Berkshire, they prepare it for a manure in two different ways. The first is by burning it to ashes; the second, by making use of the dust alone without any other process whatever, except that of exposing it to the air and frost; which causes it to moulder down into a powder.

"The peat ashes made use of in those parts are either the refuse of the fuel burnt by private families, or such as are manufactured in quantity, for the sole purpose of manure.

"When peat is burnt for manure, it is made into great heaps, and burnt by a slow fire: it sometimes takes six or eight weeks to finish the process; and the slower the better, as it is always observed that the best ashes are made from a slow fire. Two cart-loads of dry stuff will, when properly applied, burn 5000 bushels of ashes. The ashes here are red; but the white answer equally well as manures. The price upon the spot where they are burnt, is only 1½d. per bushel. It is reckoned so good a manure, as to be carried ten or twelve miles.

"For an acre of good peat, a proprietor in Berkshire will sometimes get 200l. and his land returned to him in a situation infinitely better than before the peat was burnt. The ashes are sown by the hand, like soot.

“ Peat Dust.—The peat-dust costs 6s. per waggon load, and is often carried “ seven or eight miles.”

The above account will, we hope, stimulate the proprietors and farmers throughout Great Britain and Ireland, who have peat mosses in their neighbourhood, to pay suitable attention to that hitherto neglected, but valuable article ; and what renders such an attention peculiarly necessary is, that the greatest quantities of moss, are met with in situations, where scarce any other Manure can be procured.

XL. WOOD-ASHES.

This article is useful as a Manure, principally on account of the quantity of fixed vegetable alkali, or pot-ash which it contains. It is proper, however, to observe, that the ashes of some kinds of wood contain very little of the vegetable alkali, such as the different kinds of *fir*, *pine*, &c.; this observation is very requisite to be known, as it informs the attentive husbandman of those kinds of wood which are the most likely to repay his labour, and furnish him with a good Manure when burnt.* *Oak*, *ash*, *broom*, *southernwood*, *bazel*, *bickery*, *furze*, and most of the hard woods abound with this alkali, and if their ashes be properly prepared, and applied in sufficient quantity, they will be found to produce valuable effects.

Except upon the strongest and most tenacious soils, the rich kinds of wood-ashes will be too stimulating a Manure, perhaps they ought seldom or never to be used in any other form than that of a compost, either with *earth* and *dung* or with *earth*, and *animal substances*, such as *blood*, *garbage*, the *carcasses of dead animals*, &c. ; where these composts are well proportioned and mixed, they may be applied either as top-dressings, or in the furrows for drill crops with great ease, and with very profitable success.

A very rich Manure may be made by sprinkling coarse oil upon wood-ashes, in the proportion of half a gallon to a load, then mixing the ashes with equal parts of quick lime, and adding six loads of earth to one of this mixture ; twelve loads so proportioned and mixed, will be a top-dressing sufficient for an acre. When wood-ashes are applied by themselves, they will produce the best and most permanent effects upon strong clays, and heavy, deep inactive loams ; upon light soils, or where the bottom is composed of chalk or limestone they will be hurtful.

In all cases where there is what is called a sour soil, they will very effectually correct it, consequently upon poor meadows, or rushy grounds, they will produce effects similar to lime, and if applied in sufficient quantity will very effectually kill the plants which formerly grew upon those lands, this they will do in their simple state, but if mixed with quick lime their beneficial effects will be heightened.

* In Sweden, however, they burn their fir woods for Manure, which shows that the whole benefit does not arise from the alkali.

XLI. COAL-ASHES.

This species of Manure seems well adapted for clays and deep loams, wherever it is applied in quantity upon such lands, it is found to produce good effects, by destroying or breaking the tenacity of stiff soils, and rendering them more productive.

In situations where a moderate quantity of this Manure has been used for any crop, the benefit resulting therefrom is very obvious ; but in the neighbourhood of great towns, where much of it is made, and used, the soil has been in many instances rendered so loose, that even in moderately dry years the crop fails ; this misfortune is partly owing to the effects of the drought, and partly to the incoherent quality of the soil, which prevents the plants from establishing themselves so completely as to be able to resist the effects of a strong wind ; accordingly it is observed that upon soils that have been rendered loose by this Manure, the crop is always hurt by a violent wind about the middle or end of July ; it is then so much shaken at the root by every blast, that in place of filling and ripening properly, it decays and goes backward. It is only upon very loose soils that this accident happens, and those especially that have been often manured with lime or coal-ashes.

We would recommend it to farmers in every part of the kingdom, to apply coal-ashes upon their stiffest, sourest, and coldest lands, on all of which they will produce excellent effects ; but upon light soils, such as gravel, sand, chalk, limestone, or very light lam, they ought never to be used but in the form of a compost with earth, or earth and dung, in that way they may be used with safety, and will produce the best effects ; though upon such soils, used by themselves, they are very often hurtful.

Where much sea weed, or the refuse of mustard manufactures can be obtained, an excellent top-dressing may be made with coal-ashes, the shells of the mustard seed, and lime.

XLII. ASHES FROM PARING AND BURNING.

The practice of paring and burning has so long obtained in Britain, that it is proposed to give it a separate Chapter in the General Report. In this place it is only necessary to observe, that the supposed benefits resulting from the practice of paring and burning are too often counterbalanced by the evils which it occasions. It may be of use in the first breaking up of new soils when cautiously treated, but though it affords a temporary stimulus to the soil, yet by depriving it of all those articles which are carried off during the process of combustion, an irreparable loss is sustained.

XLIII. OF SEA-SALT AS A MANURE.

Upon the use of salt as a Manure much has been said, and many facts have been stated to prove its utility, which, if well founded, entitle it to very considerable notice. But as doubts have been entertained by many respectable characters upon the subject, it may require a more particular discussion.

In examining the different substances at present employed as Manures, we discover that their principal value depends upon their affording nourishment, or in rendering other things nourishing to plants; in this they all agree. If sea-salt were an agent that could hasten or promote either the process of fermentation, or the putrefaction of animal or vegetable substances, we would be at no loss to account for its operation as a Manure. The contrary, however, is the fact when the salt is free from earth.

That salt impedes putrefaction is acknowledged, as it is employed every day with the avowed intention of preventing both animal and vegetable substances from corrupting. Upon what principle, therefore, but that of a stimulating Manure, the advocates for salt expect it to operate, we are at a loss to determine; when added to butchers' meat it preserves it for years; when mixed with hay it prevents it from heating; olives are preserved by it; and in regard to salt containing an alkali similar to nitre, it is well known that the basis of nitre is vegetable alkali united to the nitrous acid, whereas sea-salt consists of the marine acid, joined to the fossil alkali; but admitting, for argument's sake, that they were the same, nitre, except as a stimulating substance, can never be employed with advantage as a Manure, as has been experienced upon various occasions.

In support of the use of salt it has been said, that upon newly drained meadows it has had very beneficial effects. It has also been mentioned that the overflowing of the tide is equally useful: but we think that neither of these prove any thing. The draining of meadows very effectually destroys rushes, and all plants that delight in a wet soil. But this change is effected merely by laying the ground dry, and by that means rendering it unfit for the growth of such plants. This is verified accordingly, for it is observed that where salt has been used upon such grounds, vegetation has been retarded in proportion to the quantity laid on; where small quantities were used vegetation always appearing the soonest; and in rainy seasons where the salt was weak, and soon washed out of the soil, the crop, whether of corn or grass, was always earlier and better.

In situations where the tide occasions an overflow of the low grounds, it has generally been supposed that the benefit was owing to the salt water. This certainly is a very erroneous opinion, as there are few instances in which the grounds are covered by the tide; what are generally termed salt marshes being nothing more than low grounds overflowed by the rivers which run through them, and which by the obstruction they met with at their outlet, regorge, and overflow their banks. Indeed the slightest observation will convince any man of sense that the sea cannot possibly overflow these grounds, for upon carefully examining the high-water mark, it will be found in most instances considerably below the level of these marshes; now that the sea should, by entering the mouth of a river, acquire the power of rising above its own level, is a doctrine which common sense refuses to acknowledge.

In several parts of England and Scotland we have examined lands of this description, particularly in the neighbourhood of *Colchester, Liverpool, &c.* these grounds consist of low meadows, which are generally overflowed at high tides, but this overflow is occasioned by their own waters; and accordingly upon tasting the water it will frequently be found fresh, or at most slightly brackish.

The benefit derived in such cases is certainly similar to what results from watering; the advantages of which are now perfectly ascertained.

The above observations apply strictly to pure salt. Many years ago the government, from a conviction of its being useful, allowed the duty to be drawn back upon all salt employed as a Manure, and in order to prevent the salt thus sold from being applied to any other purpose, the revenue officers were directed to mix soot with it at the time of delivery. The low price, together with the high character that had been given of it, induced many farmers in the County of Haddington, in Scotland, to make trial of it, some of them upon a very large scale; by them it was used in every different shape, upon all kinds of soil, and at all the different seasons of the year; the result was, that after several years' experience it was given up, from a thorough conviction of its being in general useless, and often hurtful.

A very different account of its effects is given in the Chester Report, where several instances of the beneficial consequences attending the use of it are mentioned upon very respectable authority. In regard to the first of these, we have said in the beginning of this article, that the principal improvement of sour, wet, rushy ground, is owing to draining, this by laying it dry, not only corrects the *acidity*, but also disqualifies it for nourishing the plants which formerly grew there; their destruction therefore is to be attributed solely to this cause, and as such lands are generally very rich, they are no sooner drained than they spontaneously produce a better herbage; we are acquainted with many instances where this has happened without the addition either of salt, or any other substance; this opinion is strengthened by the account given in one of the instances alluded to. A comparative trial was made by laying eight bushels upon one acre, and sixteen upon another, where the eight bushels were laid, not a blade of grass appeared till the end of May, and where sixteen were used it was the end of July before any vegetation took place. In both trials vegetation was completely destroyed, and the length of time taken to restore it was in proportion to the quantity of salt employed. Now salt being a substance entirely soluble in water, is there not good reason to suppose that it was washed out of the ground before a new set of plants came up?

There is a species of refuse salt, better known by the name of *dreg* or *bittern*, which promises to be useful as a Manure; this is the residuum that remains after the pure salt is extracted, and consists of the muriatic acid joined to the earth of magnesia, when evaporated to dryness, perhaps a part of the acid is carried off by the heat, and there is then a proportion of uncombined earth of magnesia. It is then found to contain much more of this absorbent earth than it does of acid, and is then in the state of an imperfect neutral salt. In this way, if it is employed in agriculture, it will be useful as a Manure in all situations where marl or chalk produce good effects.

Probably the addition of alkaline salts would render it more valuable, and as great quantities of it are daily thrown away, which if properly managed, might be found useful; we recommend careful experiments to be made with it.

While we have thus ventured to give an opinion against the use of salt as a Manure, except as a stimulus, candour, and a desire to render this Report as useful as possible, obliges us to mention the account given by Sir John Pringle, where, from the result of well conducted experiments, it appeared that salt in small quantities assists putrefaction. We confess that much deference is due to such high authority; but we are extremely sorry to add, that similar trials of our own, have by no means served to establish the opinion, as we have invariably found that in all cases where salt was used

upon animal substances, putrefaction was longer in taking place in proportion to the quantity employed, and that upon comparing bits of flesh where even the smallest quantity of salt was used, with those that had received none, putrefaction always took place first upon the latter, under similar circumstances of *heat, air, light, &c.**

We have also to take notice of an instance of the valuable effects of salt as a Manure, communicated to the President of the Board, by a gentleman of Sussex, who had made the experiment, which we beg leave to give in his own words.

"About sixteen years ago I purchased twelve bushels of foul salt, at 1s. per bushel, which was sown with wheat in the month of October, with a clean fallow, on a light soil. The proportion was two bushels of salt and two of wheat per acre. It had the effect of binding or laying the land very close, and the wheat appeared all the winter of a fine deep healthy green colour. The following spring being very dry, the ground appeared crusty and hard upon the top about the end of March; this crust was in some measure broken by twice rolling with a heavy oak roller; and had the roller been furnished with *spikes* or *teeth* the wheat would have been infinitely better.

"The salt seemed to have the effect of destroying all worms, grubs, and vermin of every kind, not a particle of dung was laid on. If dung had been applied, from twelve to fifteen loads would have been required per acre, which, counting the first cost of the dung, together with the expence of carriage and filling would have cost 2s. 7d. per load. The succeeding crops of barley and clover were remarkably fine, much better than when dung had been used, and even to this day the ground seems to feel the benefit of the salt-dressing. Indeed nothing but seeing it in its former state, and seeing it now, could convince any person that so small a quantity of salt could produce such good and lasting effects. The additional duty upon that article, which is now raised to 6s. 3d. per bushel, has prevented the gentleman from repeating his experiments."

XLIV. GYPSUM.

This article has hitherto been little used in Britain as a Manure, and in the instances where it has been employed, the accounts of its value are very contradictory; in some cases it has been represented as producing astonishing effects, in others no visible advantage has been derived from it, and in several instances it has done mischief. Before we enter into any discussion upon the subject, it will be necessary to state that gypsum consists of a mineral acid joined to a calcareous earth. This acid is well known to be as unfriendly to vegetation as calcareous earth is favourable to it, and upon the proportion of it contained in gypsum the value of that article as a Manure depends.

When calcareous earth is added to any of the acids, they unite, and compose earthy

* The difference in the result of Sir John Pringle's experiment and that of the ingenious writer of this Paper, may be satisfactorily accounted for upon the supposition, that in the one case the sea-salt used, contained earthy matter, such as muriate of magnesia, and in the other, that the sea-salt was free from this impurity: to which earthy salt is to be imputed the septic effects observed by Sir J. Pringle.

salts, differently named according to the acid made use of. If this compound contains a due proportion of the acid and the calcareous earth, it is said to be neutralized ; but if either the acid or the calcareous earth predominate, the compound then possesses acid, or earthy properties.

We suppose therefore that in cases where calcareous earth is the prevailing principle in gypsum, its beneficial effects as a Manure will be visible, because in that case a portion of the earth will not be united with the acid, and will therefore be left at liberty to act upon the soil.

In cases where these two ingredients are equally balanced, the compound possesses very little solubility in water. It is perhaps in these cases where it produces little effect, nor is it possible it can ; because unless the parts of any substance are soluble in water they generally can produce no effect on vegetation.

Lastly, where the acid predominates in gypsum, of which, however, we recollect no instances, its mischievous effects will be visible, as acids of all sorts are inimical to vegetation.

In this way we account for the different effects produced by gypsum, and also for the gypsum brought from certain places being more valuable than that brought from others. In many cases its value will depend upon its containing more calcareous earth than acid. Upon lands therefore, where no stimulating substance has been applied, and which contain little or no calcareous earth in themselves, this sort of gypsum will be a good Manure ; accordingly in America, where the soil in most places is composed almost entirely of vegetable earth, arising from the decayed herbage and the deciduous parts of the trees which have grown and decayed there since the creation, and where scarcely a particle of calcareous earth is to be met with, this sort of gypsum will stimulate the soil, and produce good effects ; even in this country, upon virgin soils, which contain no principles of that sort, its effects will be similar ; but upon lands which have been long in a state of cultivation, which have been frequently manured with substances containing much alkaline matter, or which have received a due proportion of calcareous earth, its effects will not be perceptible, unless an enormous quantity be used. But in cases where the acid prevails, its bad effects will be visible at once. In all cases therefore, where gypsum is intended to be used, it ought to be a matter of serious inquiry, first, whether the land has been previously limed, and next whether the acid or calcareous earth prevails in its composition. If the land possess in itself no calcareous matter, the gypsum which contains most of it will produce good effects ; but in all cases where the acid prevails, it will certainly do harm.

This account of the nature of gypsum we are enabled to give, from having carefully examined different sorts of it. In some of these, the calcareous earth prevailed ; and in others the substance was a neutral compound. We pronounce, therefore, that in all cases where the calcareous earth prevails in gypsum, it will be useful, if the ground has not been previously limed.

In cases where the acid and earth are equally balanced, it will have other effects.

And in cases where the acid prevails, it will uniformly do harm ; unless, perhaps, upon chalk or limestone lands.

It is therefore a Manure that can seldom be used with advantage in this country upon arable lands ; as there are few situations indeed in which the soil does not either contain calcareous matter in itself, or has received it as a Manure.

XLV. BURNT CLAY.

In a succeeding chapter of the General Report, notice will be taken of the effects resulting from paring and burning the surface. An operation which, it will be observed in that place, requires to be very cautiously practised. But though the burning of clay, or any kind of soil, may be prejudicial, yet there are instances where it may, in an indirect manner, be of use. These are in cases where the soil is very stiff, and strongly retentive of moisture. A mixture of burnt clay upon such soils, will not only break their cohesion, and make them more easily cultivated, but will also render them less retentive of moisture, and by that means more friendly to vegetation. *The letter referred to in the note gives a well authenticated account of the success of a variety of experiments; but we must observe, that attempts of the kind there mentioned, can only be made upon deep clay lands, where a part of the soil can be spared, and a sufficiency remain for other purposes. Upon such lands, especially if the substratum is limestone or chalk, considerable benefit will arise from burning a part of the soil, and mixing it with the rest; because, clays so situated are upon examination always found to contain a considerable proportion of calcareous matter, which, by the operation of burning, is brought into the same state as quick lime. In this way, a double benefit is obtained; first, by furnishing an unperishable article, which, if applied in sufficient quantity, will for ever prevent the soil either from being difficultly laboured, or from retaining too great a proportion of moisture; and, secondly, by putting into it a proportion of calcareous earth, which by the operation of the fire will act as a useful Manure.

But upon thin clays, and all soils of that description, any attempt at burning would be highly improper. Such lands, even in their natural state, contain too little of the principles necessary to vegetation. When any considerable part of them, therefore, is burnt, the soil is not only divested of the principles which it originally contained,

* In a letter from Jas. White Parsons Esq. of West Cawel, to the President of the Board, he gives an account of his practice of burning clay, in nearly the following words:—

"When I had the honour of a few minutes conversation with you last Christmas, you was much pleased with the account I gave you of my method of burning, trenching earth and ant-hills. I believe I then told you, that the improvement had never succeeded with me in any less degree than 10s. an acre, upon strong wet clays, spoiled by stagnant water.

"Last year I burnt 1600 loads at least in one week, not less than 500 loads in one heap. The expence, as near as I can calculate, did not exceed 1½d. per load. I therefore leave you to judge of the cheapness and permanency of this Manure; and how much the texture of a cold retentive clay must be improved by a dressing of unperishable ashes, and calcareous rubble, at the rate of 50 or 60 bushels an acre, which the soil affords upon the spot, free of cost, as the sub-soil must otherwise be removed at a heavy expence, and to a greater distance than the fires.

"What is a very interesting circumstance, I find that lime is afterwards a very powerful manure upon such lands, though it had formerly been tried in three times the quantity, without doing the smallest service.

"As I do not find that this husbandry has been practised by any other person, and as there can remain no doubt of its public utility, I have only to regret, that it should be confined entirely to the limits of my estate.

(Signed)

West Cawel, near Sherborne, 10th April, 1795.

JAMES WHITE PARSONS."

but the earthy part is rendered so completely useless, as to render any future attempt to improve it abortive.

While we thus give our assent to the practice of burning clay upon deep soils, we wish it to be understood, that this is only in situations where lime is either extravagantly high in its price, or cannot be procured at all. In such cases, burning is the *sine qua non*; but in every instance, where lime or coal ashes can be procured at a reasonable price, and in sufficient quantity, the use of them, even upon the stiffest and most retentive clay, will be found both the cheapest and most valuable improvement.

It being now completely ascertained, that those substances not only render clays looser and less retentive of moisture, but also, by their action upon the oils, and other principles contained in the soil, convert the whole into useful nourishment for vegetables without any loss whatever.

Whereas when clay is burnt, a part of the soil is rendered for ever useless. And if this practice is adopted upon a thin soil, the loss thereby sustained is irreparable.

CONCLUSION.

Such are the facts and observations which are submitted to the consideration of the reader, on this important branch of Agriculture; from which it is sufficiently evident, that the subject is far from being so well understood as could be wished for; many present modes of practice requiring to be amended, and many points still demanding investigation and experiment. On the whole, however, it would appear, that if all the different sorts of Manures above treated of were properly collected, prepared, and applied, they are sufficient to preserve, if not to increase the fertility of our soil; and to be the means of producing a sufficient quantity of sustenance for the stock, and the people of the country. To those who are friends to the improvement of these kingdoms in the culture of grain, it is hardly necessary to remark, that without a particular attention to Manures, any great increase of tillage cannot be looked for, and that nothing but an attention to this subject can prevent more ground being laid down to grass, and consequently our depending for grain more than ever on importation from foreign states.

In the preceding observations, as little allusion as possible has been made to chemical doctrines, this paper being intended for the use of the practical farmer. It may not be improper, however, briefly to mention those authors whom the reader may consult, as furnishing materials more immediately connected with the philosophy of Manures.

The discoveries made by Dr. Priestley and Mr. Cavendish, relative to airs or gases, and the composition of water, and Mr. Bertholet's Papers on the Composition of animal and vegetable Mucilages, are of immediate application to Agriculture. Dr. Ingen-Housz, and M. Hassenfratz, have suggested some new and important principles, concerning the nutriment of plants; and Mr. Kirwan's excellent Paper on Manures, printed in the Irish Philosophical Transactions, confirms the theory of these gentle-

men, and applies it to practice.* Lord Dundonald has been laudably employed in applying the new chemistry (without a knowledge of which this subject cannot be thoroughly understood) to agricultural improvements, by the publication of his valuable work, which contains many important facts, not elsewhere to be found.† Regarding the great department of calcareous Manures, the reader is referred to the fundamental discoveries of the celebrated Dr. Black, in his Paper on Alkaline Substances, published in the Literary and Physical Essays of Edinburgh, in 1755; and to the Bishop of Llandaff's chemical Essays, who throws new light upon every subject he undertakes to illustrate. Dr. Home, Dr. Fordyce, and Dr. Hunter, have also made many interesting observations, not only on agricultural subjects in general, but upon Manures in particular.

It is more than probable, that from the attention which philosophers have recently paid to vegetation, some discoveries may be made, of the utmost importance to agriculture, which may contribute very materially to augment the sustenance, and consequently to promote the most essential interests of society. But more facts are wanting to form a theory of important application in practice. Experiments are wanting, to shew the substances contained in different soils, to explain the comparative powers of different substances in nourishing plants, and to ascertain the greatest quantity of nourishing matter which can be produced in different circumstances. There is no doubt that the lands of this island, if cultivated in the most advantageous manner, would furnish aliment for thrice the number of its present inhabitants; and it is not improbable, that by a judicious selection of plants for the nourishment of cattle, or by extending the system of watering of land, where it is applicable, that animal food might be obtained in far greater quantities from the same lands, than at present. If the wealth of a nation depends upon the number of its inhabitants, and if that number depends upon the abundance of food which a country possesses, it naturally follows, that Agriculture is the most important political object to which the legislature of any state can direct its attention; and that the nearer it is brought to perfection, the more a nation is likely to enjoy internal happiness, and external prosperity.

* Mr. Kirwan attributes the discovery, that the carbonic substance is an essential ingredient in the food of all vegetables, to M. Hassenfratz; but it is acknowledged by that gentleman himself, that he only prosecuted the discoveries originally made by Dr. Ingen-Housz.

† A Treatise shewing the intimate Connection that subsists between Agriculture and Chemistry, &c. by the Earl of Dundonald, 4to. London, 1795. Sold by Edwards, 142, Bond-street.









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